Transport for NSW

Wallendbeen Bridge over rail

Addendum review of environmental factors

February 2025



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NSW GOVERNMENT

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Acknowledgement of Country

Transport for NSW acknowledges the traditional custodians of the land on which we work and live.

We pay our respects to Elders past and present and celebrate the diversity of Aboriginal people and their ongoing cultures and connections to the lands and waters of NSW.

Many of the transport routes we use today – from rail lines, to roads, to water crossings – follow the traditional Songlines, trade routes and ceremonial paths in Country that our nation's First Peoples followed for tens of thousands of years.

Transport for NSW is committed to honouring Aboriginal peoples' cultural and spiritual connections to the land, waters and seas and their rich contribution to society.



Prepared by NGH and Transport for NSW



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Executive summary

The proposed modification

Transport for NSW (Transport) is building a new bridge over the Main Southern Railway line on the Burley Griffin Way in the NSW South West Slopes at Wallendbeen (the project). Heavy rainfall in March 2021 damaged the original brick arch bridge, necessitating its removal during emergency work. Transport replaced the original bridge soon after with a temporary single lane bridge for Burley Griffin Way traffic. The temporary single lane bridge currently allows traffic through the site under traffic control.

The new bridge sits about 20 metres southwest of the original bridge alignment and is now complete. It features increased vertical clearance above the rail line to accommodate future double-stacking of containers on trains. The new bridge deck stands about three metres higher than the old bridge, requiring raised approaches on both sides. This height increase affects the Burley Griffin Way and its intersections with four adjacent local roads.

Transport is proposing to raise and realign these local road intersections, expanding the project footprint at Silo Road, Morrisons Hill Road, North Jindalee Road and Cemetery Road intersections. The proposal includes four ancillary areas for compounds and materials stockpiling:

- existing road stockpile area on Bland Street, 370 metres east of the project
- existing road stockpile area on Cullinga Road, 980 metres south east of the project
- existing laydown area at Wallendbeen Silo, 700 metres north east of the project
- land within the project near North Jindalee Road and Cemetery Road intersection.

The December 2021 Review of Environmental Factors (REF) *"Provision of overbridge at Wallendbeen"* assessed environmental impacts of the bridge construction and Burley Griffin Way realignment. Since that assessment preceded final design completion, this addendum REF will evaluate environmental impacts of the road construction and operation based on the now-completed detailed road design.

Background

Transport's Maintenance and Delivery branch is developing and delivering the road construction for the project. A constructability analysis identified the need for additional compound facilities and areas for stockpiling construction materials. Transport has nominated four locations for ancillary activities, as detailed above. These areas have not previously been subject to environmental assessment and consideration and will also form part of the proposed modification assessed in this addendum REF.

The proposal will also use the compound and laydown site alongside Silo Road that the project REF previously assessed, as shown in Figure 1-2. This location requires no additional environmental assessment.

Need for the proposed modification

The proposed modification is needed to achieve the objectives outlined in the project REF, by completing the connection of the new overbridge to the existing road network. The proposed modification also meets the strategic objectives of the *NSW Freight and Ports Plan 2018-2023*. It fulfills the plan's Objective 3: Capacity by supporting the Key action:

Make capacity boosting investments in the rail freight network by improving the capacity of east-west movements through targeted improvements to the NSW rail network and supporting the Inland Rail Project.

Proposal objectives

The project REF identified the project objectives and development criteria which also apply to the proposed modification:

- reinstating road connectivity between local and regional roads
- facilitating the transportation of goods and services by rail
- restoring access for the local community
- improving road safety
- strengthening local economies
- creating stronger employment opportunities
- minimising impact on the environment
- minimising impact on the community

The proposal maintains the objectives set out in the project REF.

Options considered

Following assessment and approval of the new bridge, construction commenced. Transport subsequently began designing and assessing the interaction of the new bridge and Burley Griffin Way approaches with the local road network. The design and assessment of the proposed local road connections considered the following options:

- Option 1 – Realignment and raising local roads
- Option 2 – Raising of local roads on current alignments
- Option 3 – Closure of local road access to Burley Griffin Way.

Transport selected Option 1 as the preferred option. This option has a slightly larger footprint but best meets the community needs and the proposal objectives.

Statutory and planning framework

Part 5, Division 5.1 of the EP&A Act imposes environmental assessment obligations on determining authorities. Part 5, Division 5.1 applies to activities (as defined in section 5.1) that:

- a Minister or public authority carries out
- occur on behalf of a Minister or public authority
- require the approval of a Minister or public authority.

This constitutes development without consent under the *State Environmental Planning Policy (Transport and Infrastructure) 2021*. Transport will carry out the proposal, acting as both the proponent and determining authority.

The proposal requires no referral under the EPBC Act.

Community and stakeholder consultation

Transport carried out community consultation via drop-in sessions, media, digital/social media campaigns and letter box drops. Transport invited local residents to provide feedback on the proposed bridge design. Feedback primarily concerned the lack of pedestrian access included with the new bridge. Section 5 summarises community consultation.

Environmental impacts

The main environmental impacts for the proposed modification are listed below.

Biodiversity

The addendum proposal would create additional biodiversity impacts beyond those the project REF assessed. The proposed work would remove 0.614 ha native vegetation from within the proposal area, an increase of 0.374 ha from the determined REF. Due to the current edge effects experienced by this woodland and its proximity to nearby roads and rail infrastructure, the proposal is not considered an action that would further fragment or reduce the quality of terrestrial habitat within the proposal area.

Noise

The proposal would have some noise impacts on nearby receivers during the construction phase, particularly during the site establishment and road work peak stages. Transport can manage noise impacts through the mitigation measures this addendum REF recommends. Operational noise impacts have been predicted to be negligible with no increase at opening and a 1 dB increase 10 years after opening.

Property acquisition

The proposal requires additional property acquisition with partial acquisition of Lot 10 DP 180692.

Justification and conclusion

The proposed modifications in the addendum REF are considered justified as they would create little additional negative impact. Transport will manage impacts with the appropriate mitigation measures outlined within this addendum REF. On balance, the modified proposal would have an overall positive impact by reestablishing and improving road and rail networks. In doing so, the proposal achieves the stated project objectives.

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1. Introduction

1.1 Proposed modification overview

Transport for NSW (Transport) is proposing to modify the *Provision of Overbridge at Wallendbeen Project* (the project) by raising the height of the Burley Griffin Way and associated local road intersections (proposed modification). Key features of the proposed modification include:

- raising the height of Burley Griffin Way by about three metres at the new overbridge
- altering the height and location of local road intersections with the Burley Griffin Way adjacent the project
    - reconnecting on a new alignment the intersection of North Jindalee Road and Cemetery Road
    - reconnecting on a new alignment the intersection with Morrisons Hill Road and Silo Road
    - extracting water for road construction from existing water sources using previously disturbed areas
    - relocating the temporary bridge to an existing compound area for dismantling and removal using cranes and trucks
- removing redundant highway pavement in the old bridge alignment, with rehabilitation of this area
    - using up to four ancillary areas for compound and stockpiling of materials for the project including:
        - existing stockpile area at Bland Street, 900m^2, 370 metres east of the project
        - existing stockpile area at Cullinga Road, 600m^2, 980 metres south east of the project
        - existing laydown at Wallendbeen Silo, 1200m^2, 700 metres north east of the project
        - land within the project adjacent to the North Jindalee Road and Cemetery Road intersection.

The location of the proposed modification is shown in Figure 1-1. Section 3 describes the proposed modification in more detail.

A project Review of Environmental Factors (REF) was prepared by NGH Pty Ltd titled *Provision of Overbridge Wallendbeen*, December 2021 (referred to in this addendum REF as the project REF). The project REF was not published or displayed and no other addendum REFs have been prepared for the project to date. Transport asked for community feedback on the design of the permanent road over rail crossing in April 2022. Transport held a drop-in information session on Thursday 5 May at Mackay Park Rest Area, Wallendbeen. Transport sought the community's feedback between Friday 29 April to Thursday 5 May.

The completion of the detailed design for the overbridge has increased the footprint of the project. The proposed increase in the footprint of the project (Figure 1-2) described above predominantly affects the local road network. Those changes are the subject of this addendum REF.

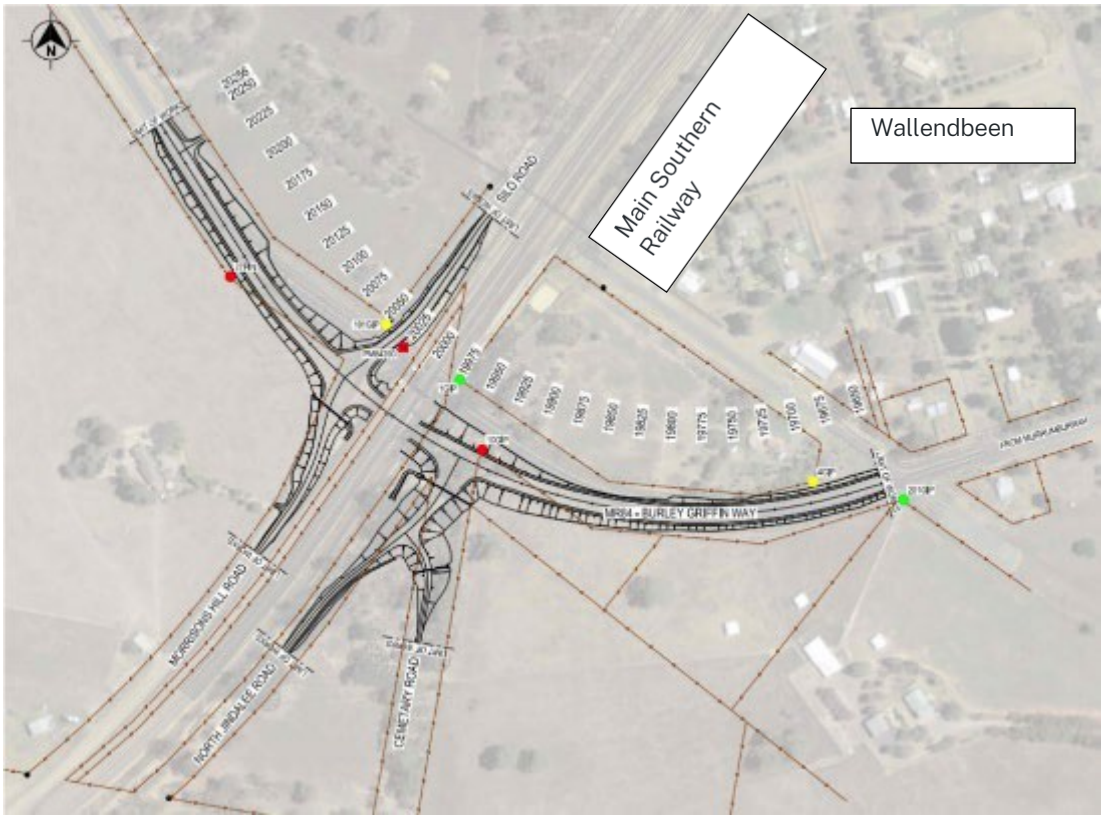


Figure 1-1: Location of the proposed modification



Figure 1-2 Comparison of Project REF and addendum REF development footprints

1.2 Purpose of the report

This addendum Review of Environmental Factors (REF) has been prepared by NGH Pty Ltd on behalf of Transport's Maintenance and Delivery branch. Transport is the proponent and the determining authority under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the purposes of this work.

This addendum REF is to be read in conjunction with the project REF. The purpose of this addendum REF is to describe the proposed modification, to document and assess the likely impacts of the proposed modification on the environment, and to detail mitigation and management measures to be implemented.

The description of the proposed work and assessment of associated environmental impacts has been carried out in context of section 171 of the Environmental Planning and Assessment Regulation 2021, *Is an EIS Required? Best Practice Guidelines for Part 5 of the Environmental Planning and Assessment Act 1979* (Is an EIS Required? guidelines) (DUAP, 1995/1996), *Roads and Road Related Facilities EIS Guideline* (DUAP, 1996), the *Biodiversity Conservation Act 2016* (BC Act), the *Fisheries Management Act 1994* (FM Act), and the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

In doing so, the addendum REF helps to fulfil the requirements of:

- section 5.5 of the EP&A Act including that Transport examine and take into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity.

The findings of the addendum REF would be considered when assessing:

- whether the proposed modification is likely to result in a significant impact on the environment and therefore the necessity for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning under Division 5.2 of the EP&A Act
- the significance of any impact on threatened species as defined by the BC Act and/or FM Act, in section 1.7 of the EP&A Act and therefore the requirement for a Species Impact Statement or a Biodiversity Development Assessment Report
- the significance of any impact on nationally listed biodiversity matters under the EPBC Act, including whether there is a real possibility that the activity may threaten long-term survival of these matters, and whether offsets are required and able to be secured
- the potential for the proposed modification to significantly impact any other matters of national environmental significance or Commonwealth land and therefore the need to make a referral to the Australian Department of Climate Change, Energy, the Environment and Water for a decision by the Australian Government Minister for the Environment on whether assessment and approval is required under the EPBC Act.

2. Need and options considered

2.1 Strategic need for the proposed modification

Section 2 of the Review of Environmental Factors (REF) *Provision of Overbridge at Wallendbeen*, December 2021, addresses the strategic need for the project, the project objectives and the options considered. The proposed modification described and assessed in this addendum REF is consistent with the strategic need for the project.

The proposed modification is needed to achieve the objectives outlined in the project REF, by completing the connection of the new overbridge to the existing road network. The proposed modification is also needed to meet the strategic objectives of the NSW Freight and Ports Plan 2018-2023. The proposed modification meets the plan's Objective 3: Capacity by supporting the key action:

Make capacity boosting investments in the rail freight network by improving the capacity of east-west movements through targeted improvements to the NSW rail network and supporting the Inland Rail Project.

The proposed modification supports the raising of the new bridge height by about three metres. Raising the new bridge height would allow railway carriages to be double-stacked with shipping containers at this location. Double-stacking of containers increases the amount of freight that can be carried by a train and the rail network. As such the proposed modification meets the strategic objectives of the NSW Freight and Ports Plan 2018-2023.

2.2 Proposal objectives and development criteria

Section 2.2 of the project REF identifies the proposal objectives and development criteria that apply to the proposed modification. These objectives are:

- reinstating road connectivity between local and regional roads
- facilitating the transportation of goods and services by rail
- restoring access for the local community
- improving road safety
- strengthening local economies
- creating stronger employment opportunities
- minimising impact on the environment
- minimising impact on the community.

The proposal maintains the objectives set out in the project REF.

2.3 Alternatives and options considered

2.3.1 Methodology for selection of preferred option

The preferred option for the proposal has been nominated by analysing how each option satisfies the above project objectives, whilst also addressing the criteria of cost of the works and the projected timeline of construction.

2.3.2 Identified options

Option 1 – Realignment and raising local roads

This option involves relocating intersections and associated realignment of the following local roads:

- Morrisons Hill Road
- Silo Road
- North Jindalee Road
- Cemetery Road.

The raising of the local roads would ensure that the existing interfaces of the state and local road networks are maintained and the operational capacity of the networks are largely unchanged. The minor relocation of the intersections and associated minor road realignments would enable current road design requirements to be met and improve road safety by:

- improving sight distances
- increasing safety of vehicles queuing and waiting to make turning movements
- installating safety barriers and increased lane widths at intersections.

This option would require the acquisition of some adjoining land and the clearing of some roadside vegetation. The installation of safety barriers would increase maintenance requirements near the intersections.

Option 2 – Raising of local roads on current alignments

The local roads connecting the Burley Griffin Way would be raised in level to meet the new alignment of the highway on their current alignment. Current design standards would not be met, the requirements for sight and stopping distances to provide a safe road environment would not be achieved. This option would also require acquisition of adjoining property and clearing of vegetation less than option 1. The embankments for the local road would also likely encroach on the rail corridor and trigger additional land access obligations.

Option 3 – Closure of local road access to Burley Griffin Way

This option would involve the construction of the raised Burley Griffin Way to match the increased levels of the new bridge over the railway with the intersections to local road connections being permanently closed to significantly reduce the construction footprint and also reduce social and environmental impacts.

2.3.3 Analysis of options

Each of the above identified options satisfy several of the stated proposal objectives. Each achieves the goals of:

- reinstating road connectivity between local and regional roads
- facilitating the transportation of goods and services by rail
- restoring access for the local community
- improving road safety
- strengthening local economies
- creating stronger employment opportunities.

However, where the options differ is their impacts on the surrounding environment and community. Option 2 has a larger impact on the environment due to the increased area that would be required to facilitate construction of the intersections but does not meet current road design standards and wouldn't meet road safety requirements. Option 3 has the least impact on the receiving environment by having the smallest construction footprint but does not meet the needs of the users of the local road networks and residents of the village of Wallendbeen. Option 1 has the largest construction footprint, however the requirements of the local community and improvements in road safety are best met with this option, these social outcomes outweigh the minor increase in impact to the natural and built environment.

The preferred option is Option 1 – Realignment and raising local roads. This option has been chosen as it best meets the stated proposal objectives.

3. Description of the proposed modification

3.1 The proposed modification

Transport is proposing to modify the Review of Environmental Factors (REF) *Provision of overbridge at Wallendbeen*, December 2021 by increasing the footprint of the project to allow for construction on the local road network to match the increased height of Burley Griffin Way by about 3m at the approaches to the new bridge. The proposed modification is shown in Figure 1-1.

Key features of the proposed modification include:

- raising the height of Burley Griffin Way by about three metres at the new overbridge. This would allow for future double stacking of containers on the Great Southern Railway line
- altering the height and location of local road intersections with the Burley Griffin Way adjacent the project to match the increased height of the overbridge
  - Lifting and relocating the intersection of North Jindalee Road and Cemetery Road to align with the raised level of Burley Griffin Way.
  - Lifting and relocating the intersection of Morrisons Hill Road and Silo Road to align with the raised level of Burley Griffin Way.
- extracting water for construction from existing water sources.
- placing the temporary bridge using cranes in the existing compound area for dismantling and removal.
- removing redundant highway pavement in the old bridge alignment, with rehabilitation of this area.
- using up to four ancillary areas for compound(s) and stockpiling of materials for the project including:
  - existing stockpile area at Bland Street, 900m^2, 370 metres east of the project
  - existing stockpile area at Cullinga Road, 600m^2, 980 metres south east of the project
  - existing laydown at Wallendbeen Silo, 1200m^2, 700 metres north east of the project
  - land within the project adjacent to North Jindalee Road and Cemetery Road intersection.

The comparison of the development footprint between the project REF and this addendum REF is shown above in Figure 1-2. The site layout and locality are shown below in Figure 3-1.



Figure 3-1: Approximate site layout of the proposal area

3.2 Design

3.2.1 Design criteria

The new bridge for the project has been designed to the Australian Bridge Standards to carry heavy vehicles including B-doubles and larger trucks. The bridge approaches and local road intersections have been designed in accordance with the Austroads Design Guide and relevant supplements.

3.2.2 Engineering constraints

The main engineering constraints present that have been considered in the proposal are:

- vertical alignment of the new overbridge to allow for the double stacking of freight containers on the train line
- horizontal alignment of the finished Burley Griffin Way to allow for adequate sight lines and stopping distances within a 60km/h speed environment
- ensuring the lane widths and shoulders match that of the existing road design
- ensuring the pavement of the road approaches meet the requirements for B-double loads and over dimension vehicles.

3.2.3 Main features of the modification

The main features of the modification to the project REF include:

- raising the height of the new overbridge by approximately three metres to facilitate the future double-stacking of containers on the Great Southern Railway Line
- raising the height of Burley Griffin Way by the same height of three metres so the finished road surface will align with the new bridge deck
- altering the height and alignment of all connecting roads that intersect with Burley Griffin Way in the proposal area
- carrying out additional property acquisition
- removing the temporary overbridge
- removing and rehabilitating the old, redundant road alignment.

3.3 Construction activities

3.3.1 Work methodology

Construction of the proposal would involve:

- establishing compound and laydown areas including amenities, temporary fencing and signage
- establishing traffic controls
- establishing environmental controls (exclusion zones; erosion and sediment controls)
- establishing a water supply point
- trimming and removing vegetation within the project work areas
- stripping and stockpiling topsoil and unsuitable soils for the work
- building the new road, intersections and property accesses:
    - preparing road subgrade
    - importing, placing and compacting fill material to required height

    - importing, placing and compacting road base
    - excavating the pavement for the stormwater pipes and headwalls
    - installing stormwater pipes and headwalls
    - backfilling and covering stormwater pipes and headwalls
    - trimming batters to the final design shape
    - applying the road seal
    - installing road furniture along the new alignment
    - installing line marking to delineate lane configurations
- establishing cranes and removing temporary bridge
- dismantling the temporary bridge and removal off site
- removing redundant road. Existing bridge abutments will remain in place
- rehabilitating the site/revegetating
- removing site offices, amenities, temporary fencing and traffic controls.

The above activities can be summarised into broad construction phases of the project, and these representative scenarios enable the assessment of likely impacts, primarily noise and vibration, from each phase of construction. Each phase can then be broken down further into 'typical' and 'peak' work scenarios. 'Peak' represents works when the noisiest plant and machinery is in use, which would typically be only for short periods of time. 'Typical' represents works which do not involve the noisiest plan and equipment, which would be for longer periods of time around the 'peak' uses.

Table 3-1 below provides a breakdown of each representative scenario as used in the Noise and Vibration Impact Assessment, using information supplied by Transport.

Table 3-1 Construction scenario descriptions

ID	Scenario[1]	Description
W.01	Site establishment and early work - typical	This work would include: Site compound construction, fencing, installation of environmental controls Utility adjustment and tree removal / trimming. Peak work would generally include noise intensive equipment such as chainsaws and chippers. Typical work would generally include supporting equipment such as excavators, loaders, trucks and cranes.
W.02	Site establishment and early work - peak	
W.03	Earthwork and drainage - typical	This work would include: Removal of topsoil, stockpiling and/or disposal Earthwork including preparation of new pavement areas, foundation treatment, grading and compacting Installing/altering drainage infrastructure, as required. Peak work would generally include noise intensive equipment such as vibratory rollers and graders. Typical work would generally include supporting equipment such as excavators, loaders, trucks and street sweepers.
W.04	Earthwork and drainage - peak	
W.05	Road work - typical	This work would include: construction of the pavement layers including the subbase and asphalt layers on the new bridge approaches tie-ins to pavement at existing road. Peak work would generally include noise intensive equipment such as vibratory rollers, pavement laying machines and pavement profilers. Typical work would generally include supporting equipment such as excavators, loaders, trucks and street sweepers.
W.06	Road work - peak	
W.07	Landscaping and finishing work - typical	This work would include: installation of road furniture pavement marking landscaping work removal of all remaining temporary work such as traffic control barriers and ancillary facilities. Peak work would generally include noise intensive equipment such as vibratory rollers, graders and pneumatic hammers. Typical work would generally include supporting equipment such as excavators, loaders, line marking equipment and street sweepers.
W.08	Landscaping and finishing work – peak	
W.09	Compounds and stockpiles - typical	This work would include: bulk material storage and laydown area plant and equipment storage construction worker parking and site offices stockpile management Typical work would generally include supporting equipment such as excavators, loaders, trucks and street sweepers.
W.10	Compounds - peak	This work would include disassembly of the temporary modular bridge. Peak work would generally include noise intensive equipment such as cranes and pneumatic hammers.

3.3.2 Construction hours and duration

Construction would be expected to begin in the second quarter 2025 and take about 26 to 52 weeks to complete depending on access to land and weather conditions.

Construction working hours would be expected to be within standard working hours, with an option for out of hours work on Saturday afternoon. The proposed construction hours are:

- Monday-Friday: 7am to 6pm
- Saturday: 7am to 6pm
- Sunday and public holidays: no work

Work may, however, be carried out on a rotating 10-day on/four-day off roster. This option has been considered as the 'worst-case' scenario and has been used to model noise and vibration impacts from the proposal.

3.3.3 Plant and equipment

General equipment used during the work would be likely to include:

- loaders
- compactor
- excavators
- rollers
- graders
- trucks/truck and trailer
- concrete trucks
- cranes
- generators
- light vehicles
- pneumatic drivers
- asphalt profiler
- asphalt paver
- water trucks
- water trucks
- hand tools
- chainsaws
- stump grinder
- woodchippers
- skid steer loaders
- street sweeper.

Water to be used for the project would be sourced from either the potable water supply or from Cunningham Creek to the northeast of the proposal area.

3.3.4 Earthwork

Topsoil would be removed from the construction area and stockpiled for reuse during site rehabilitation.

Fill material and road base would be required to be imported to the proposal area to facilitate raising of the finished road surface to the height of the new bridge.

3.3.5 Source and quantity of materials

Where possible, gravel material would be sourced locally from existing quarries. The approximate quantity of gravel materials required are estimated to be:

- 37,000 tonnes of general fill material
- 14,000 tonnes of road base material.

Water would be sourced from existing sources and about 1.5 megalitres would be required for the work, weather dependent.

3.3.6 Traffic management and access

Access to the proposal area would be via a network of sealed and unsealed public roads. Highways and local roads near the proposal would be used as transport routes. Access to the proposal is available from Cootamundra or Young would be via the Burley Griffin Way and Olympic Highway as required. Access to the proposal from Temora and Yass is also available along the Burley Griffin Way.

3.4 Ancillary facilities

The addendum proposal may make use of four additional ancillary areas for compounds and stockpiles sites to those assessed in the project REF:

- existing stockpile area at Bland Street, 900m^2, 370m east of the project
- existing stockpile area at Cullinga Road, 600m^2, 980m south east of the project
- existing laydown at Wallendbeen Silo, 1200m^2, 700m north east of the project
- land within the project adjacent to North Jindalee Road and Cemetery Road intersection.

The proposal will also make use of the existing laydown and compound area alongside Silo Road. This area was assessed in the project REF, as such, no further investigations will be required.

Both Bland Street and Cullinga Road are existing stockpile sites used by Cootamundra Gundagai Regional Council. The proposal would also make use of a portion of Lot 1 DP 819706, containing Wallendbeen Silo. This includes 1200m^2 of land leased from NSW Grain Corporation Ltd. The location of this leased area is shown in Figure 3-1.

The location of each ancillary site is shown in Figure 3-1 and the existing condition of each site is shown in Figure 3-2 through Figure 3-4.



Figure 3-2 Looking southeast across the existing Bland Street Stockpile site



Figure 3-3 Looking southwest over the existing Cullinga Road stockpile site



Figure 3-4 Existing condition of the proposed compound area at Wallendbeen Silo

3.5 Public utility adjustment

An underground telecommunications cable may need to be relocated to allow for the relocation and reconstruction of the Morrisons Hill Road intersection.

3.6 Property acquisition

The proposal would require the acquisition of parts of the below properties, as shown in Figure 3-5, for the purpose of road realignment.

Table 3-2: Proposed property acquisition

Area ID	Description	Total area	Acquisition type	Current owner	Lot and DP	Land use zone (LEP)
1	42 Morrisons Hill Road, Wallendbeen	3812m^2	Required acquisition	Private property	Lot 2 DP 1054376	RU1 – Primary Production
2	1627 Burley Griffin Way, Wallendbeen	2390m^2	Required acquisition	Private property	Lot 10 DP 180692	RU1 – Primary Production
3	28 Hoskins Street, Wallendbeen	2317m^2	Required acquisition	Private property	Lot 1 and 296 DP 1090341 and 753630	RU1 – Primary Production



Figure 3-5 Proposed property acquisition

4. Statutory and planning framework

4.1 Environmental Planning and Assessment Act 1979

4.1.1 State Environmental Planning Policies

State Environmental Planning Policy (Transport and Infrastructure) 2021

Chapter 2 (Infrastructure) of SEPP (Transport and Infrastructure) aims to facilitate the effective delivery of infrastructure across the State.

Section 2.108 of SEPP (Transport and Infrastructure) permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent.

As the proposed modification is for a road and is to be carried out by Transport, it can be assessed under Division 5.1 of the EP&A Act. Development consent from council is not required.

The proposal is not located on land reserved under the *National Parks and Wildlife Act 1974* and does not require development consent or approval under:

- State Environmental Planning Policy (Resilience and Hazards) 2021
- State Environmental Planning Policy (Planning Systems) 2021
- State Environmental Planning Policy (Precincts – Central River City)
- State Environmental Planning Policy (Precincts – Eastern Harbour City)
- State Environmental Planning Policy (Precincts – Regional) 2021
- State Environmental Planning Policy (Precincts – Western Parkland City) 2021.

Section 2.10 to 2.15 of SEPP (Transport and Infrastructure) contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development.

Consultation, including consultation as required by ISEPP (where applicable), is discussed in section 5 of this addendum REF.

State Environmental Planning Policy (Biodiversity and Conservation) 2021

The proposal area is not located within the Sydney Drinking Water Catchment, and is therefore not subject to be considered under the Biodiversity and Conservation 2021 SEPP.

4.1.2 Local Environmental Plans

The proposal area is located within the Cootamundra-Gundagai Regional Council Local Government Area (LGA). The proposed works are located in an area covered by the Cootamundra Local Environment Plan (Cootamundra LEP). The proposal would take place within land zone SP2 Roads and RU1 Primary Production. Both zones allow roads with consent.

The objectives of SP2 land zone are:

- to provide for infrastructure and related uses
- to prevent development that is not compatible with or that may detract from the provision of infrastructure.

The objectives of RU1 land zone are:

- to encourage sustainable primary industry production by maintaining and enhancing the natural resource base
- to encourage diversity in primary industry enterprises and systems appropriate for the area
- to minimise the fragmentation and alienation of resource lands
- to minimise conflict between land uses within this zone and land uses within adjoining zones
- to protect and conserve deposits of extractive materials and allow their extraction by limited development where appropriate
- to protect and conserve native and other vegetation in order to preserve scenic amenity and to minimise land degradation.

Development consent is not required for road developments as the TISEPP overrides this requirement.

4.2 Other relevant NSW legislation

4.2.1 State Environmental Planning Policy (Koala SEPP) 2021

The Koala SEPP 2021 reinstates the policy framework of SEPP Koala Habitat Protection 2019 to 83 Local Government Areas (LGA) in NSW. The principles of the Koala SEPP 2021 are to help reverse the decline of koala populations by ensuring koala habitat is properly considered during the development assessment process and to provide a process for councils to strategically manage koala habitat through the development of koala plans of management.

The Koala SEPP 2021 is not applicable to activities assessed under Part 5 of the EP&A Act.

4.2.2 State Environmental Planning Policy (Koala SEPP) 2020

The Koala SEPP 2020 encourages the conservation and management of natural vegetation that provides habitat for Koalas. Although Koala SEPP 2021 has been introduced, Koala SEPP 2020 continues to apply for all RU1, RU2 and RU3 zoned land outside of the Sydney Metropolitan Area and the Central Coast.

The Koala SEPP 2020 is not applicable to activities assessed under Part 5 of the EP&A Act.

4.2.3 Biodiversity Conservation Act 2016 (NSW)

The purpose of the *Biodiversity Conservation Act 2016* (NSW) (BC Act) is to:

- conserve biological diversity at bioregional and state scales
- maintain the diversity and quality of ecosystems
- support biodiversity conservation in the context of a changing climate
- assess the extinction risk of species and ecological communities, and identify key threatening processes
- establish a framework to avoid, minimise and offset the impacts of proposed development and land use change on biodiversity.

Section 5A of the EPA&A Act lists a number of factors to be considered when deciding if there is the likelihood of a significant impact on any of the above. If there is a chance of an impact, then a Test of Significance (ToS) would be required to determine the significance of the impact. If there is likelihood of a significant impact on threatened species, populations, and their habitat or on ecological communities then a Species Impact statement (SIS) is required.

Section 6.3 discusses the potential impacts of the proposed work on threatened species, populations or Endangered Ecological Communities (EECs) in the vicinity of the proposed work areas.

4.2.4 Heritage Act 1977

The *Heritage Act 1977* (NSW) (Heritage Act) provides protection for items of 'environmental heritage' in NSW. 'Environmental heritage' includes places, buildings, works, relics, movable objects, or precincts considered significant based on historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic values. Under the Heritage Act, a person must not disturb or excavate land if they know or have reasonable cause to suspect that they might discover, expose, move or damage a relic unless they have an excavation permit.

Items considered to be significant to the State can be listed on the State Heritage Register (SHR) and cannot be demolished, altered, moved, or damaged, or their significance altered, without approval from the Heritage Council of NSW. Other items may be listed on the National and Commonwealth Heritage Lists, State Heritage Inventory (SHI) or by local Councils in LEPs. Additionally, under Section 170 of the Heritage Act, all government agencies are required to identify, conserve, and manage heritage items in their ownership or control. Items are typically listed in a Heritage and Conservation Register and may also be included on the SHI.

No additional impacts on heritage to those outlined in the project REF would be expected as part of the proposal.

4.2.5 Roads Act 1993

The objectives of this Act are:

- to set out the rights of members of the public to pass along public roads, and
- to set out the rights of persons who own land adjoining a public road to have access to the public road, and
- to establish the procedures for the opening and closing of a public road, and
- to provide for the classification of roads, and
- to provide for the declaration of Transport and other public authorities as roads authorities for both classified and unclassified roads, and
- to confer certain functions (in particular, the function of carrying out road work) on Transport and on other roads authorities, and
- to provide for the distribution of the functions conferred by this Act between Transport and other roads authorities, and
- to regulate the carrying out of various activities on public roads.

Section 138 of the Roads Act prohibits work on or over a public roadway without approval from the Roads Authority. Transport is the proponent and determining authority for the proposal.

4.2.6 Biosecurity Act 2015 (NSW)

The *Biosecurity Act 2015* (NSW) (Biosecurity Act) provides a framework for the prevention, elimination and minimisation of biosecurity risks. The Biosecurity Act and supporting Biosecurity Regulation 2017 (NSW) provide for the establishment and functions of Local Control Authorities for weeds (LGA or County Councils) and weed control obligations on public and private land.

No additional impacts or safeguards relating to biosecurity risks to those outlined in the project REF would be expected as part of the proposal

4.2.7 National Parks and Wildlife Act 1974 (NSW)

The objectives of this Act are the conservation of nature, objects, places or features of cultural value within the landscape, fostering public appreciation understanding and enjoyment of nature and cultural heritage and their conservation and providing for the management of land reserved under this Act in accordance with the management principles applicable for each type of reservation.

Part 6 of the Act refers to Aboriginal objects and places and prevents persons from impacting on an Aboriginal place or relic, without consent or a permit. The Transport for NSW *Procedure for Aboriginal cultural heritage consultation and investigation* (PACHCI) was followed.

Impacts on Aboriginal heritage values are assessed in Section 6.5 of this REF.

4.3 Commonwealth legislation

4.3.1 Environment Protection and Biodiversity Conservation Act 1999

Under the EPBC Act a referral is required to the Australian Government for *proposed 'actions that have the potential to significantly impact on matters of national environmental significance or the environment of Commonwealth land'*. These are considered in Appendix D and E and section 6 of the addendum REF.

A referral is not required for proposed road actions that may affect nationally listed threatened species, endangered ecological communities and migratory species. This is because requirements for considering impacts to these biodiversity matters are the subject of a strategic assessment approval granted under the EPBC Act by the Australian Government in September 2015.

Potential impacts to these biodiversity matters are also considered as part of section 6 of the addendum REF and Appendix D and E.

Findings – matters of national environmental significance (other than biodiversity matters)

The assessment of the proposed modification's impact on matters of national environmental significance and the environment of Commonwealth land found that there would be no change to the findings of the determined activity and would be unlikely to cause a significant impact on matters of national environmental significance or the environment of Commonwealth land. A referral to the Australian Department of Climate Change, Energy, the Environment and Water is not required.

4.3.2 Other relevant Commonwealth legislation

4.4 Confirmation of statutory position

The proposed modification is categorised as development for the purpose of a road and/or road infrastructure facilities and is being carried out by or on behalf of a public authority. Under section 2.108 of SEPP (Transport and Infrastructure) the proposed modification is permissible without consent. The proposed modification is not State significant infrastructure or State significant development. The proposed modification can be assessed under Division 5.1 of the EP&A Act. Consent from Council is not required.

5. Consultation

5.1 Consultation strategy

Transport staff met with interested community members at a drop-in information session held on the Thursday 5 May 2022. The community was informed of the upcoming drop-in session via a media release, social media post, project website and a notification letter delivered to all Wallendbeen residences.

Fourteen pieces of feedback were received during the consulting period, which ran from the Monday 2 May to Friday 20 May. An additional 70 informal pieces of feedback were made via comments on the social media post. While not formal, the sentiment of these comments was still considered

5.2 Consultation outcomes

The key themes arising from community feedback surrounded the lack of pedestrian and cyclist access included in the permanent bridge design. Transport for NSW has since updated the design of the bridge to include a two-metre shoulder on both sides of the bridge to provide access for cyclists. Transport is also investigating options to provide pedestrian access in the future.

Other issues raised are summarised below in Table 5-1.

Table 5-1: Summary of issues raised by the community

Group	Issue raised	Response / where addressed in addendum REF
Residents	Catering for semi-trailers and B-doubles	The updated bridge has been designed to Australian Bridge Standards to carry heavy vehicles, including B-doubles and larger trucks.
Residents	Will there be traffic impacts during construction?	The temporary bridge will remain open during construction, resulting in minimal disruptions.
Residents	Intersection safety	The intersections have been designed based on the latest Australian Standards and best practice and would improve sight distances and turning paths.

Table 5-2: Issues raised through Aboriginal community consultation

Group	Issue raised	Response / where addressed in addendum REF
N/A		

5.3 Ongoing or future consultation

Ongoing consultation with the Wallendbeen community will be carried out during the construction of the road approaches to keep the community informed of any potential road impacts.

Transport will continue to work with council and the community to explore funding opportunities to improve pedestrian connectivity in the village, however this is outside the scope of the addendum REF.

6. Environmental assessment

This section of the addendum REF provides a detailed description of the potential environmental impacts associated with the construction and operation of the proposed modification of the provision of overbridge at Wallendbeen. All aspects of the environment potentially impacted upon by the proposed modification are considered. This includes consideration of the guidelines Roads and Related Facilities EIS Guideline (DUAP, 1996) and Is an EIS required? (DUAP, 1999) the factors specified in section 171 of the Environmental Planning and Assessment Regulation 2021. The factors specified in section 171(2) of the Environmental Planning and Assessment Regulation 2021 are also considered in Appendix F.

Site-specific safeguards and management measures are provided to ameliorate the identified potential impacts.

6.1 Topography, Geology and Soils

6.1.1 Methodology

The proposal area was compared to that of the project REF, with all additional areas assessed for additional environmental impacts. Areas of overlap that were originally assessed by the project REF have not been assessed again; however current database searches were completed to ensure relevant information has not been updated.

6.1.2 Existing environment

The proposal occurs within the South Western Slopes IBRA Bioregion. A summary of the topography, geology and soils is detailed in Table 6-1 below. The land of the surrounding locality has been developed with road and rail, nearby rural residential dwellings and agricultural land uses. None of these nearby land uses have changed since the preparation of the project REF.

Table 6-1 Existing environmental characteristics

Category	Study Area
Topography	The site is situated within a relatively flat landscape with an elevation ranging from 470 to 475 m ASL. The site is gently sloping from the south-west to the north-east. Murrumburrah Hill is located 2 km east of the proposal area.
Geology	MinView (Geological Survey of NSW, 2018) maps the proposal area as being underlain by Alluvium of a quaternary age. The unit consists of *"Unconsolidated grey to brown to beige humic (±)micaceous silty clay, quartz-(±)lithic silt, fine-to medium-grained quartz-rich to quartz-lithic sand, polymictic pebble to cobble gravel (as sporadic lenses); sporadic palaeosol horizons."*
Soils	The soils within the proposal area are classified as Ferrosols under the Australian Soil Classification. Ferrosol soils are friable and crumbly red soils that are prone to water erosion if left bare.
Acid sulphate soils	There is a low probability for acid sulphate soils (ASS) to occur throughout the proposal area (NSW Government, n.d.)
Naturally Occurring Asbestos (NOA)	The proposal falls within an area that may have naturally occurring asbestos. It is classified as being of low asbestos potential (refer Figure 6-1 of the project REF).

Contaminated land

A search of the NSW EPA's Contaminated Land Record and List of Contaminated Sites Notified to the EPA for the suburb of Wallendbeen was carried out on 20 January 2024. There are no identified contaminated lands within or adjacent to the proposed work.

Potential impacts

While the proposal detailed within this addendum REF has a larger disturbance area than that in the project REF, there would be no greater or additional impacts on soils to those already outlined and assessed in the project REF.

The raised road intersections with Burley Griffin Way would result in a minor change to the local topography by no more than three metres in some places. This impact is determined to be minor and requires no further mitigation measures.

6.1.3 Safeguards and management measures

No further mitigation measures to those outlined in the project REF are required for this addendum REF.

6.2 Hydrology, catchment values and water quality

6.2.1 Methodology

The proposal area detailed within this addendum REF was compared to that of the project REF, with all additional areas assessed for additional environmental impacts. Areas of overlap that were originally assessed by the project REF have not been assessed again; however current database searches were completed to ensure relevant information has not been updated.

6.2.2 Existing environment

The proposal area lies within the Lachlan catchment area and is regulated under the Water Sharing Plan for the NSW Murray Darling Basin Fractured Rock Groundwater Sources 2012.

A second Strahler Stream Order (SSO) tributary of Cunningham Creek occurred within the northwestern portion of the proposal area of the project REF, however the amended proposal area no longer impacts this tributary.

Cunningham Creek is also listed as Key Fish Habitat (KFH) by the Fisheries NSW Spatial Data Portal. No works have been proposed within 200 m of this tributary. The proposed works would require about 1.5 megalitres of water for the purposes of dust suppression and conditioning of gravel and other road materials. Transport intends to source this water from Cunningham Creek, approximately 1.2km north of the proposal Area. Appropriate permissions and permits from NSW DCCEEW will be required to access this water.

Groundwater dependent ecosystems (GDEs)

Aquatic Groundwater Dependant Ecosystems (GDE) are mainly associated with higher order drainage lines and creeks. No aquatic GDEs are mapped within the proposal area. The nearest mapped GDE is Cunningham Creek, located about 285m east of the proposal area (BOM, 2021a).

There is one area of high probability terrestrial GDE mapped across the proposal Area. This GDE is associated with Blakelys Red Gum-Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion (Figure 6-2 of the project REF).

Flooding

The proposal area is not identified as flood prone land under the Cootamundra LEP 2013. However, short-term localised flooding may occur within the proposal area following extreme rainfall events.

6.2.3 Potential impacts

While the proposal detailed within this addendum REF has a larger disturbance area than that in the project REF, there would be no greater or additional impacts on hydrology, catchment values or water quality to those already outlined and assessed in the project REF.

The exception to this may would be the extraction of surface water from Cunningham Creek. However, providing that the appropriate mitigation measures outlined in the project REF and permit from DCCEEW are implemented, there would be little risk of negative impact on the hydrologic values of the creek.

6.2.4 Safeguards and management measures

One further mitigation measures to those outlined in the project REF are required for this addendum REF:

- all requirements of the NSW DCCEEW permit for water extraction will be included in the CEMP.

6.3 Biodiversity

6.3.1 Methodology

Threatened Species Evaluation

Database searches were completed for records of Commonwealth and State listed threatened species, populations, and ecological communities. Searches were conducted on 3 December 2024 and included:

- EPBC Protected Matters Search tool records within 10 km of the study area
- NSW BioNet Atlas Search within 10 kilometres of the study area
- Office of Environment and Heritage (OEH) threatened species search by IBRA region
- NSW Biodiversity Values Map and Threshold Tool
- DPI Threatened Species Freshwater Indicative Distributions
- DPI Key Fish Habitat
- DPIE Vegetation Information System, State Vegetation Mapping.

Site Inspection

A field survey was conducted on 21st November 2024 by one NGH ecologist. Floristic surveys were completed to determine the vegetation communities present. The study area was surveyed using the 'random meander' method, as documented by Cropper (1993). The survey included an assessment of the condition and composition of existing vegetation. Hollow bearing trees (HBTs) and potential threatened species habitat were assessed. Opportunistic fauna sightings were also recorded. Species were recorded progressively with abundance recorded within proposal area. Any priority weeds were recorded opportunistically.

State Vegetation Mapping (SVM) is available for the study area. The Riverina state vegetation mapping (SVM) (VIS ID_4469) was used to help determine potential Plant Community Types (PCTs) within the study area (DPIE, 2020). Based on the flora species identified during the field survey, vegetation within the proposal area was assigned to a Plant Community Type (PCT) in accordance with the Vegetation Information System Classification Database (OEH) (DPIE, 2020).

Threatened Ecological Communities (TEC) were confirmed based on the relevant Scientific Committee – final determinations for each TEC. Botanical nomenclature follows the PlantNet website (PlantNet, 2024).

Relevant literature was reviewed, which included OEH and EPBC Threatened Species Profiles.

No areas of declared outstanding biodiversity value as listed under the BC Act are present within the proposal area. The proposal area does not contain significant wetland communities.

An evaluation of the potential for threatened species to occur and be impacted by the proposal is shown in Appendix C.

6.3.2 Existing environment

The proposal area was observed to be largely exotic. Overstorey and mid-storey species were absent throughout much of the proposal area, occurring only as isolated patches on either side of Burley Griffin Way. This was attributed to prior disturbance within the road corridor and would explain the high proportion of exotic groundcover species recorded during the site survey.

Isolated patches of woodland were observed within the proposal area. This woodland was found to be consistent with PCT 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion.

Overstorey species within the proposal area predominantly consisted of Blakely's Red Gum (*Eucalyptus blakelyi*) and Yellow Box (*Eucalyptus melliodora*). A few isolated Kurrajongs (*Brachychiton populneus*) were also scattered throughout the proposal area. Scattered shrubs, including Hickory Wattle (*Acacia implexa*) and exotic Blackberry *(*Rubus spp.*)* species, were observed within the woodland patches. The groundcover was observed to be largely exotic. The proposal area contained fallen timber, partially buried rocks, hollow bearing trees and patches of bare ground, covered in leaf litter.

Plant Community Types

The following plant community type was identified within the proposal area (refer Figure 6-1):

- PCT 277 *Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion.*

A description of this PCT and its condition at the time of survey is provided in Table 6-2.

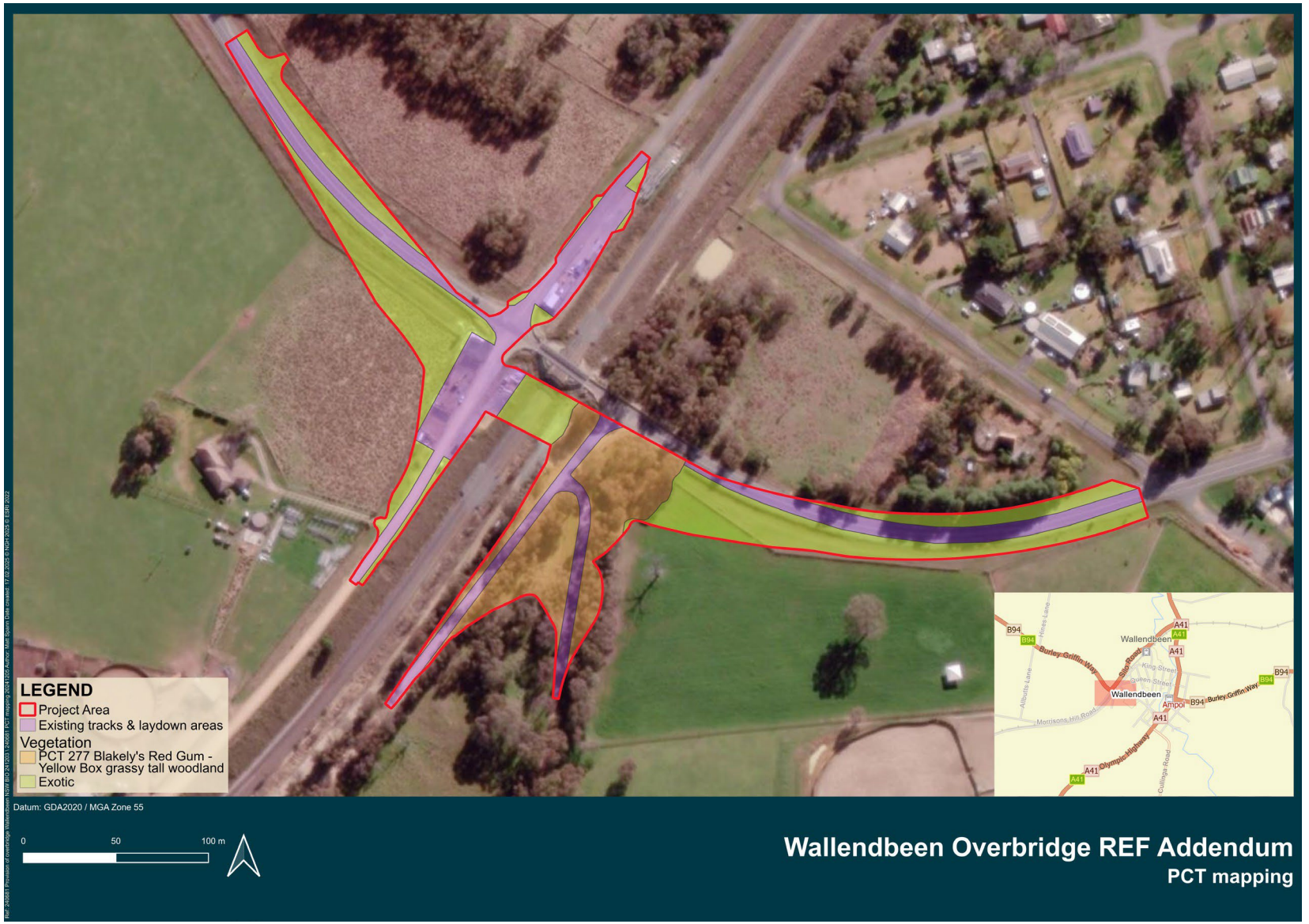


Figure 6-1 Plant Community Types within the project area

Table 6-2 Plant community type description

PCT 277 Blakely's Red Gum -Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	
Vegetation Formation	Grassy Woodlands.
Vegetation Class	Western Slopes Grassy Woodlands.
Description	Tall woodland to 20 m high, dominated by Blakely's Red Gum (*Eucalyptus blakelyi*). Yellow Box (*Eucalyptus melliodora*) was also present in lower densities. A sparse shrub layer was observed in the, containing Hickory Wattle (*Acacia implexa*), and Blackberry (**Rubus spp.*) species. In the additional roadside areas Privet (**Ligustrum lucidum*), and Hawthorn (**Crataegus monogyna*) were also identified. A mid-dense or dense ground cover was observed, dominated by exotic species such as Lambs Tongue (**Plantago lanceolata*), Onion Grass (**Romulea rosea*), Capeweed (**Arctotheca calendula*), Variegated Thistle (**Silybum marianum*) and Common Sowthistle (**Sonchus oleraceus*). In the additional areas a mix of native and exotic vegetation, with Phalarus (*Phalaris aquatica*), Wheat (*Triticum aestivum*), Fog (*Holcus lanatus*), Rye grass (*Lolium sp.*), and oats (*Avena sp.*). Native forbs, such as Fuzzweed (*Vittadinia spp.*), Stonecrop (*Crassula spp.*) and Mountain Burr-Daisy (*Calotis cuneata*) were also recorded. Blue flax-lily (*Dianella Revoluta*) was present in the additional roadside areas. Exotic grasses, such as Phalaris (**Phalaris aquatica*) and Paspalum (**Paspalum dilatatum*) were dominant throughout the PCT. Native grasses, such as Kangaroo Grass (*Themeda triandra*), Windmill Grass (*Chloris truncata*) and *Rytidosperma spp.* were also observed. In the additional roadside areas Plains grass (*Austrostipa aristiglumis*), Wallaby Grass (*Rytidosperma sp.*), Rough spear-grass (*Austrostipa scabra*), and Kangaroo grass (*Themeda triandra*) were all present, but never dominant. Exotics were still dominant in the understory. Overall, the understory of this PCT was observed to be highly exotic, with a very low (<15%) occurrence of native ground or shrub species present. Overstorey species within this PCT consisted of remnant native species. Some of the additional roadside areas had patches of 24% native understory cover. Overall native cover was below 20% of total understory cover.
Condition	Moderate condition. Remnant overstorey species were present; however, the ground and shrub layers were highly exotic (<15% native species).
Approximate extent within study area	Approximately 0.614 ha.
Conservation Status	This PCT is associated with: BC Act listed *White Box-Yellow Box –Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions*

	EPBC Act listed *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland* An assessment of this PCT against the BC/EPBC criteria has been provided below.
PCT 277 Blakely's Red Gum –Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	
	

Threatened Flora Species

No threatened flora species were identified during the site survey. However, due to the timing of the site survey not all flora species present within the study area may have been visible at the time of survey.

A search of the EPBC PMST, NSW BioNet Atlas and OEH database found that eight threatened flora species and two TECs have the potential to occur within the proposal area. Habitat condition within the road corridor was observed to be low. This was attributed to previous disturbance. Moderate condition woodland habitat was observed within isolated woodland patches in the proposal area. In addition to this, some threatened flora species have shown a preference for disturbed environments. Therefore, threatened flora species could occur within the proposal area.

An assessment of all threatened flora recorded within the locality was made to determine potential occurrence within the proposal area. A habitat evaluation was completed for these species (Appendix C).

Based on this assessment, habitat within the proposal area is considered suitable for:

- groundcover species:
  - *Cullen parvum* Small Scurf-pea BC – E
  - *Swainsona recta* Small Purple–pea BC – E, EPBC– E

Assessments of significant impact have been conducted under the BC Act and EPBC Act (Appendix D and Appendix E). A significant impact was considered unlikely to occur as a result of the proposed work.

Threatened Ecological Communities

The presence of Blakely's Red Gum and Yellow Box tree species indicated the potential for the NSW listed Critically Endangered *White Box-Yellow Box–Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions* (Box-gum Woodland) to occur within the proposal area.

Blakely's Red Gum trees are also associated with the federally listed TEC *White Box-Yellow Box–Blakely's Red Gum* grassy woodlands and derived native grassland listed as Critically Endangered (refer to Figure 6-2).

PCT 277 *Blakely's Red Gum-Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion* was assessed against the listing requirements under the BC and EPBC Act to determine if the woodland met the criteria for the TEC. The assessment process has been provided in Table 6-3 and Table 6-4. This PCT met the condition thresholds for listing under the NSW state BC Act. This PCT does not meet the EPBC Act listed Box-Gum Woodland, due to the exotic nature of the groundcover.

Table 6-3 Assessment criteria for BC listed Box-Gum Woodland

BC Requirements	Assessment
1. Is, or was previously, at least one of the most common overstorey species White Box, Yellow Box or Blakely's Red Gum	Yes. Blakely's Red Gum and Yellow Box are common overstorey species.
2. The site in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands or NSW South Western Slopes Bioregions.	Yes, the site is located within the NSW South Western Slopes.
3. There are no native species in the understorey, and the site is unlikely to respond to assisted natural regeneration.	Yes. Native understorey species were observed within this PCT. The site is likely to respond to assisted natural regeneration.
Assessment outcome	Yes – Box-Gum woodland. An assessment of Significance (AoS) has been conducted for this TEC (Appendix D).

Table 6-4 Assessment criteria for EPBC listed Box-Gum Woodland

EPBC Requirement	Assessment
Is, or was previously, at least one of the most common overstorey species White Box, Yellow Box or Blakely's Red Gum?	Yes, Blakely's Red Gum and Yellow Box are common in the overstorey.
Does the patch have predominantly native understorey?	No. Understorey species within the PCT were observed to be dominated by exotic perennial grasses.
Assessment Outcome	Not the listed ecological community.

Priority Weeds

Three priority weeds - Blackberry (**Rubus spp.*), Broadleaf Privet (*Ligustrum lucidum*), and Hawthorn (*Crataegus monogyna*) were identified within the proposal area. All these species are listed as General Biosecurity Duty: *All pest plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.*

Black Berry is also listed in the Riverina area of NSW, as a Regional Priority – Asset Protection: *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*

The Biosecurity Act dictates that all priority weeds are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any land managers or authorities who deal with any priority has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable. Other exotic flora that were identified within the study area are common within the region and are often encountered within disturbed areas.

Mitigation measures have been recommended to control the spread of weed seed species by the proposed work.

Terrestrial habitat

During the field surveys, five terrestrial birds, and no terrestrial mammal species or amphibian species were observed/heard within or directly adjacent to the proposal area.

A species list has been provided in Appendix A.

Terrestrial fauna habitat identified within the proposal area is detailed within Table 6-5.

Table 6-5 Terrestrial fauna habitat within the proposal area

Habitat features	Description	
Box-Gum Woodland	Remnant Box-Gum Woodland occurs in patches throughout the proposal area. Box-Gum Woodland provides valuable foraging and breeding habitat for native species.	
Fallen Timber	Fallen timber occurred throughout the proposal area. Fallen timber provides shelter and foraging resources for several native fauna species including small reptiles and ground-foraging birds.	
Rocky habitat	Rocky habitat was recorded within the proposal area. Rocky habitat provides shelter for reptiles and small mammals.	

Threatened Fauna

One threatened species, the Superb Parrot (*Polytelis swainsonii*) was observed flying over the proposal area during the 2021 site inspection. Due to the extent, variability, and quality of habitat within the proposal area,

alongside the timing and seasonality of the site survey, the presence of other threatened fauna cannot be ruled out.

A search of the EPBC PMST, NSW BioNet Atlas and OEH database found that 46 threatened (and/or migratory) fauna species have the potential to occur within 10 km of the proposal area.

A habitat evaluation was completed for these species (Appendix C).

Based on this assessment, the following woodland birds have been determined to potentially occur within the proposal area and have the potential to be impacted by the proposed work:

- *Glossopsitta pusilla* Little Lorikeet; BC – V
- *Neophema pulchella* Turqoise Parrot; BC – V
- *Polyteris swainsonii* Superb Parrot; BC – V
- *Artamus cyanopterus cyanopterus* Dusky Woodswallow; BC – V
- *Stagonopleura guttata* Diamond Firetail; EPBC – V, BC - V
- *Climateris picumnus* Brown Treecreeper; EPBC – V, BC - V

Assessments of Significance (AoS) have been completed in Appendix D and Appendix E for these species. A significant impact on these species was determined to be unlikely.

6.3.3 Summary of MNES Searches

MNES	Potential presence at Site
World Heritage Places	None
National Heritage Places	None
Wetlands of International Importance	4
Great Barrier Reef Marine Area	None
Commonwealth Marine Area	None
Listed Threatened Ecological Communities	2
Listed Threatened Species	42
Listed Migratory Species	8

No EPBC listed Wetlands of International Importance, Listed Threatened Species or Listed Migratory species were recorded during the site survey.

6.3.4 Potential impacts

Construction

Impacts associated with the work would be confined to the proposal area.

Potential impacts within the proposal area from the proposed works include:

- native vegetation removal
- disturbance and removal of threatened species habitat
- erosion, sediment and pollution runoff into waterways
- ground disturbance
- increases to Key Threatening Processes
- spread of priority weeds.

Indirect impacts from the proposed works are likely to predominately include noise and dust. Indirect impacts are expected to be minimal, temporary and occur during daylight hours only.

Vegetation loss

Areas of remnant woodland within the proposal area may be subject to clearing and disturbance during the proposed works. Vegetation removal required for the proposal is provided in Table 6-6.

Table 6-6 Vegetation removal during the works

Vegetation type	Amount within proposal area (ha)	Amount to be cleared (ha)	Threatened Ecological Community (BC Act) (ha)
PCT 277	0.614	0.614	Box-Gum Woodland
Exotic	1.169	1.169	None
Total	1.783	1.783	0.614

The proposal would result in the removal of 0.614 ha of TEC from within the development footprint (Table 6-6) an increase of 0.374ha from the determined REF. No HBTs would be impacted by the proposed works.

Vegetation clearing can lead to the introduction and spread of exotic species within native plant communities through the movement of plant machinery and vehicles. Removal of native vegetation, including regenerating and derived communities within disturbed areas can result in:

- increasing edge effects
- reducing diversity of community stratum
- introducing and establishing weeds
- reducing native vegetation connectivity
- increasing fragmentation and isolation of vegetation communities
- reducing availability and quality of habitat for fauna and flora species.

An Assessment of Significance (AoS) was conducted for threatened ecological communities with the potential to occur within the proposal area. A significant impact was considered unlikely, given:

- the amount of habitat to be removed or disturbed by the proposal is relatively small within the local context. Minimal remnant vegetation of 0.614 ha of BC Act Box-gum woodland and no HBTs would be impacted by the proposal
- minimal fragmentation or isolation of habitat would occur. As mentioned in this addendum REF the clearing is on the edge of woodland habitats, so no future fragmentation or isolation of habitat would occur
- no substantial contribution to any Key Threatening Process is expected, if mitigation measures are followed

- mitigation measures have been recommended to further reduce impacts to biodiversity.

Threatened fauna and flora

Vegetation trimming and removal, and ground disturbance from the movement of plant machinery and vehicles is expected to occur throughout the proposal area. The proposal has the potential to incur the following impacts:

- disrupting breeding fauna
- disturbing native vegetation and associated seedbanks, therefore inhibiting potential foraging and breeding habitat for fauna species
- incurring the invasion and spread of weeds, pathogens and disease
- causing temporary indirect disturbance to wildlife during construction (noise, light, spill, vibration).

Remnant vegetation would be retained onsite wherever possible. No HBTs would be removed by the proposed works. Rehabilitation of disturbed areas post completion of works is recommended to facilitate habitat recovery.

Standard mitigation measures including vehicle hygiene, erosion and environmental controls and the implementation of an unexpected finds procedure would mitigate the risk to terrestrial fauna and flora.

Terrestrial Biodiversity

The proposal is located on land mapped as containing Terrestrial Biodiversity under the Cootamundra LEP. During the site survey, the proposal area was observed to be largely disturbed, which is likely due to prior clearing and construction activities associated with the Burley Griffin Way and the Main Southern Railway line. Exotic groundcover species were observed to be dominant throughout the proposal area. The proposed works would result in a minor decrease (0.614 ha) of native vegetation from within the proposal area. Due to the current edge effects experienced by this woodland and its proximity to nearby roads and rail infrastructure, the proposal is not considered an action that would further fragment or reduce the quality of terrestrial habitat within the proposal area.

Priority weeds

The proposed works have the potential to introduce and/or spread priority weeds within and out of the proposal area. Mitigation measures have been recommended to control the spread of weed seed species by the proposed works.

An existing compound site and laydown area was observed within the proposal area. The compound site and laydown area have been cleared of vegetation and in use. No further assessment of the compound site or laydown area was conducted.

A full flora list is available in Appendix A.

Operation

As the proposal is not intended to increase traffic volumes along Burley Griffin Way, it is not expected that the proposal would have any additional impacts on biodiversity throughout the operation phase of the proposal.

Conclusion on significance of impacts

The modification is not likely to significantly impact threatened species, populations or ecological communities or their habitats, within the meaning of the BC Act or FM Act and therefore a Species Impact Statement is not required.

The modification is not likely to significantly impact threatened species, populations, ecological communities or migratory species, within the meaning of the EPBC Act.

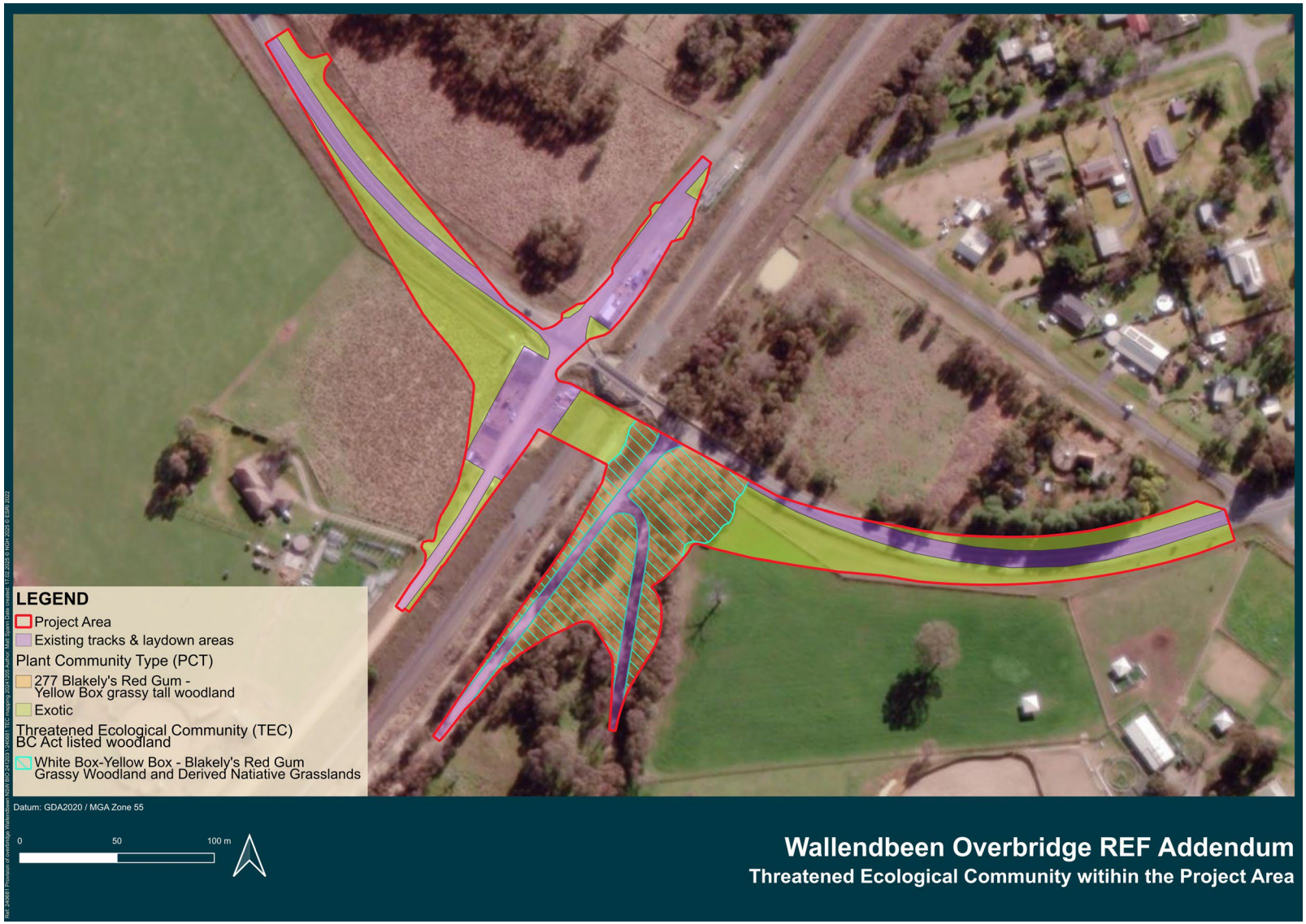


Figure 6-2 Threatened Ecological Communities within the Project Area

6.3.5 Safeguards and management measures

To summarise, the below, project-specific mitigation measures would be required:

- If threatened fauna or flora species are discovered unexpectedly, stop works immediately and follow the Transport Unexpected Threatened Species Find Procedure contained in the Transport Biodiversity Guidelines – Guide 1 (Pre-clearing process (EMF-BD-GD-0032).
- Unexpected threatened species finds: The site induction should include measures to make employees aware of potential threatened flora and fauna during works and understand the procedures if threatened fauna are detected. This would be recorded as a part of the induction procedure and toolbox talks.
- All woodland to be removed is to be surveyed by an ecologist or suitably qualified person, to record and relocate the presence of any nesting fauna.
- Vegetation removal will be undertaken in accordance with *Guide 4: Clearing of vegetation and removal of bushrock* of the Transport for NSW Biodiversity Management Guideline: *Protecting and managing biodiversity on Transport for NSW projects* (March 2024).
- Exclusion zones will be set up at the limit of clearing in accordance *with Guide 2: Exclusion zones* of the Transport for NSW Biodiversity Management Guideline: *Protecting and managing biodiversity on Transport for NSW projects* (March 2024).
- No HBTs would be removed during the proposed works. If the proposed design changes to include mature or HBT removal, further assessment would be required prior to commencement of work.
- Vegetation to be retained within the proposal area is to be clearly marked.
- All fallen timber within the proposal area is to be relocated from the development footprint to an adjacent area.
- Weed species will be managed in accordance *with Guide 6: Weed management* of the *Transport for NSW Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects (March 2024)*.
- All weed material containing seed heads, weeds that contain toxins, and weeds that are able to reproduce vegetatively should be disposed of at an appropriate waste management facility or otherwise properly treated to prevent weed growth.
- All herbicides should be used in accordance with the requirements on the label. Any person undertaking pesticide (including herbicide) application should be trained to do so and have the proper certificate of completion/ competency or statement of attainment issued by a registered training organisation.
- Plant equipment and machinery should be cleaned of all biological matter prior to entering the site.

6.3.6 Biodiversity offsets

No significant impact is likely to occur from the works so there is no statutory requirement to offset. Transports No Net Loss biodiversity policy commenced on 1 August 2022. This project was determined prior to the commencement of the Policy so in line with section 3.2.1 of the Policy it is exempted.

Transport is required to plant 300 native trees on a property adjacent the project. This was agreed as part of the property acquisition process for Lot 10 DP 180692.

6.4 Noise and Vibration

6.4.1 Methodology

A Noise and Vibration Impact Assessment (the Assessment) was conducted by SLR. The Assessment was carried out in line with:

- *Transport for NSW Construction Noise and Vibration Guideline (CNVG) 2023 (Transport, 2009)*
- *NSW Noise Policy for Industry (NPI) NSW (EPA, NSW Noise Policy for Industry, 2017).*

Transport's Construction Noise and Vibration Guideline 2023 (CNVG) provides guidance on the measurement and management of construction noise impacts. The guideline requires, a quantitative assessment of noise impacts when works are likely to impact an individual or sensitive land use for more than three weeks in total.

The CNVG describes likely 'noise management levels', for residences and other sensitive receivers. For works during standard working hours, residences are considered noise affected when construction noise is 10dB(A) above the rating background level (RBL) and 'highly noise affected' when construction noise is above 75dB(A). Works outside standard working hours are affecting sensitive receivers when construction noise is 5dB (A) above the RBL.

Other referenced policies are listed in Section 3.1.1 of the Assessment.

6.4.2 Existing Environment

The dominant sources of noise experienced in the proposal area include:

- local traffic noise
- train traffic on the Main Southern Railway line
- sounds associated with a rural environment (eg farm machinery and livestock)
- sounds associated with a natural environment (eg wind, vegetation movement and birdsong).

Potential sensitive receivers were identified in the Assessment, and their locations are shown below in Figure 6-1. To determine the existing noise environment, two noise monitoring stations were established. Noise monitoring was undertaken in November 2024 for a minimum of seven days at each location. Locations of the monitoring stations is shown below in Figure 6-1.

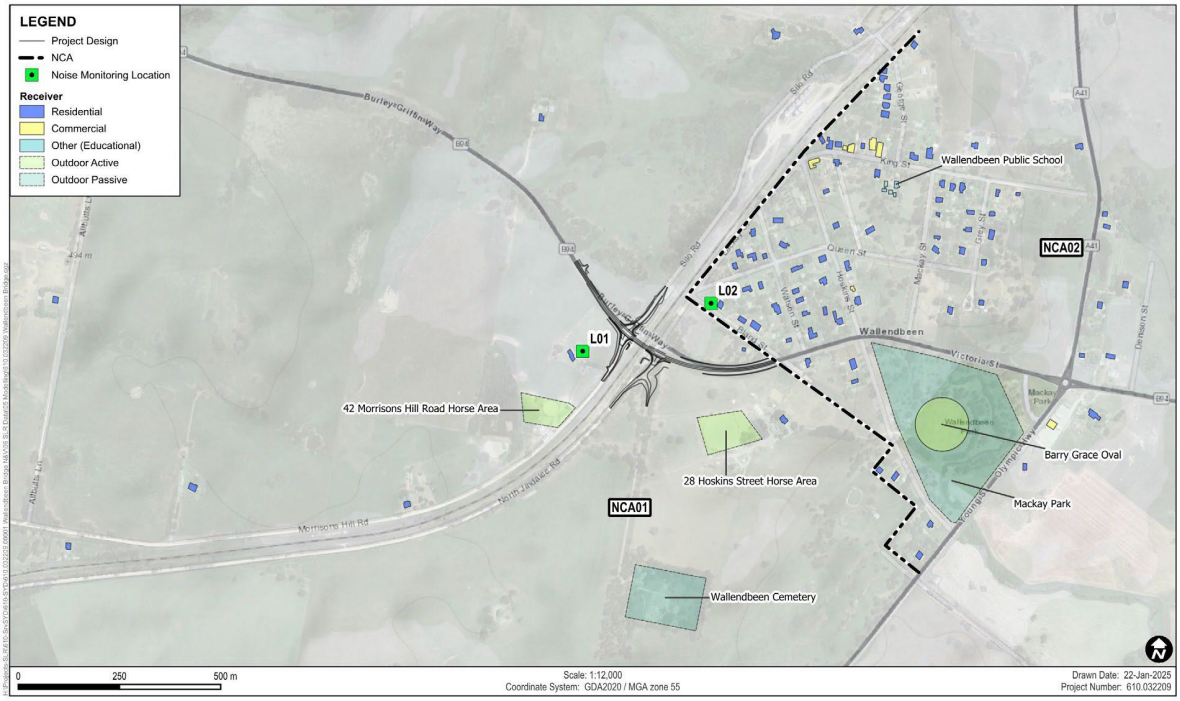


Figure 6-3 Nearby sensitive receivers and monitoring locations (SLR)

The results obtained from background noise monitoring are presented below (Table 6-7).

Table 6-7 Summary of background noise monitoring

ID	Address	Measured Noise Level (dBA)							
		Construction[1]						Operational[2]	
		Background Noise (RBL)			Average Noise (LAeq)			Average Noise (LAeq)	
		Day	Eve	Night	Day	Eve	Night	Day	Night
L01	42 Morris Hill Road	32	30	25	47	48	47	47	46
L02	1-3 Bland Street	32	32	29	47	49	47	48	47

Note 1: Construction noise is assessed during the daytime which is 7 am to 6 pm, the evening which is 6 pm to 10 pm and the night-time which is 10 pm to 7 am. See the NSW EPA *Interim Construction Noise Guideline*.

Note 2: Operational road traffic noise is assessed during the daytime which is 7am to 10pm and the night-time which is 10pm to 7am. See the NSW EPA *Road Noise Policy*.

During construction the NMLs are set as per the CNVG to be 10dB(A) above the RBL during standard hours and 5dB(A) above the RBL for out of hours. As the measured RBLs were lower than the assumed policy minimums of 35dB(A) for the daytime and 30 dB(A) for the evening and night, these assumed minimum vales have been adopted to derive the relevant NMLs.

As such, based on the existing background noise levels provided above, the following NMLs would apply to the proposal:

Table 6-8 Residential receiver construction noise management levels

NCA	Representative Background Monitoring Location	Noise Management Level (LAeq(15minute) - dBA)				Sleep Disturbance Screening Criteria (RBL +15dB)
		Standard	Out of Hours			
		Daytime (RBL +10dB)	Daytime[1] (RBL +5dB)	Evening (RBL +5dB)	Night-time (RBL +5dB)	
NCA01	L.01	45	40	35	35	45
NCA02	L.02	45	40	37	35	45

Note 1: Daytime out of hours is 7am to 8am and 1pm to 6pm on Saturday, and 8am to 6pm on Sunday and public holidays.

The relevant NML for sleep disturbance impacts has also been included in Table 6-8 as the 'worst-case' works scenario may involve some night works. If night works were to be undertaken for more than two consecutive nights, then an assessment of sleep disturbance impacts would be required as per the NSW *Interim Construction Noise Guideline* (ICNG). Is has been assumed that this requirement would not be triggered by the proposed works, and as such, a detailed assessment of sleep disturbance impacts has not been undertaken.

Other, non-residential, sensitive receivers were also identified in the assessment, including:

- Wallendbeen Cemetery
- Wallendbeen Public School
- Mackay Park
- Barry Grace Oval

Noise impacts to these receivers was concluded to be minimal, thus, they have not been included further within this chapter, as any potential impacts would be mitigated through the implementation of standard measures.

6.4.3 Potential Impacts

Construction

Noise

Modelling of potential noise impacts is considered a worst-case scenario; in that it is assumed that construction equipment is at the closest point to each receiver. For most works, this will generally not be the case, and noise impacts would likely be lower than predicted.

In the Noise and Vibration Impact Assessment, noise impacts during construction are categorised based on their NML exceedance, as shown below in Table 6-9

Table 6-9 NML exceedance bands and corresponding CNVG-R perception categories

CNVG-R Perception Category	NML Exceedance Daytime – Standard Construction Hours	Out of Hours Periods
Noticeable	-	1 to 5 dB
Clearly Audible	1 to 10 dB	6 to 15 dB
Moderately Intrusive	11 dB to 20 dB	16 dB to 25 dB
Highly Intrusive	>20 dB	>25 dB

Noise impacts were then modelled for all receivers identified in Figure 6-3, for each works scenario presented in Table 3-1. It is noted that all 'peak' scenarios were only modelled for daytime work hours and daytime out of hours period 1 (i.e., Saturdays 1PM to 6PM and Sundays 8AM to 6PM), with the exception of *Road Work – Peak*, in which works may be required at night to reduce the overall work duration and disruption to the community. The affected number of receivers, and the receivers falling into each of the above perception categories are shown below in Table 6-10.

Results from the Assessment show that the largest daytime noise impacts occur during the *Site Establishment and Early Work* construction phases. This is greatest during the peak phase, in which modelling predicts there would be 13 nearby receivers with 'highly intrusive' impacts (see Figure 6-4). However, it should be noted that the peak impacts would occur for only a short duration, and receivers would be mostly affected when works are closest to nearby receivers and impacts would be lessened when works move away.

Largest nighttime noise impacts were predicted to occur during the Road Works 'peak' construction phase, when intensive asphalting and paving equipment is in use (see Figure 6-3). At this time, there would be 20 receivers considered to have 'highly intrusive' noise impacts. Again, it should be noted that the peak impacts would occur for only a short duration, and receivers would be mostly affected when works are closest to nearby receivers and impacts would be lessened when works move away. In addition, the requirement for nighttime works would be confirmed as the project progresses.

There are two residential receivers in close proximity to the proposal which the model predicts to be 'highly noise affected' (i.e., experiencing noise over 75 dB(A). These two receivers are shown in Figure 6-6. The closest receiver, circled red, experiences three instances of being highly noise affected, with these impacts occurring during the *Site Establishment and Early Works – Peak, Road Work – Peak,* and *Landscaping and Finishing Work – Peak* construction phases. The second receiver, circled yellow, experiences a single instance of being highly noise affected during the *Site Establishment and Early Works – Peak* construction phase.

The receivers which would potentially be affected by sleep disturbance impacts are generally the same receivers where 'moderately intrusive' and 'highly intrusive' night-time impacts have been predicted. Note that although all 'typical' work scenarios have been assessed in the night-time period, this generally represents the potential for work between 7am and 8am on Sundays. The potential for sleep disturbance impacts during this period is considered low.

Construction noise impacts on nearby receivers would be mitigated through the relevant safeguards presented in Table 6-12 and Section 6.4.4.Table 6-10 Predicted Construction Noise Exceedances

ID	Scenario	Total	HNA[1]	Number of Receiver Buildings With NML Exceedance[2]																
				Standard Daytime			Daytime OOH				Out of Hours Works: Evening				Out of Hours Works: Night-time				Sleep Disturbance	
				1-10 dB	11-20 dB	>20 dB	1-5 dB	6-15 dB	16-25 dB	>25 dB	1-5 dB	6-15 dB	16-25 dB	>25 dB	1-5 dB	6-15 dB	16-25 dB	>25 dB	> Screening Level	
W.01	Site Establishment and Early Work - Typical	93	-	33	18	2	19	33	18	2	22	36	20	8	14	39	23	10	46	
W.02	Site Establishment and Early Work - Peak	93	2	43	26	13	5	43	26	13	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
W.03	Earthwork and Drainage - Typical	93	-	25	11	2	19	25	11	2	20	33	17	3	25	31	21	5	32	
W.04	Earthwork and Drainage - Peak	93	-	31	21	5	25	31	21	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
W.05	Road Work - Typical	93	-	33	18	2	20	33	18	2	22	37	22	6	14	38	26	9	37	
W.06	Road Work - Peak	93	1	38	26	9	14	38	26	9	4	37	35	15	4	34	33	20	56	
W.07	Landscaping and Finishing Work - Typical	93	-	33	18	2	19	33	18	2	22	36	20	8	14	39	23	10	33	
W.08	Landscaping and Finishing Work - Peak	93	1	37	20	9	20	37	20	9	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
W.09	Compounds and Stockpiles - Typical	93	-	37	28	3	8	37	28	3	17	29	35	6	11	30	33	13	54	
W.10	Compounds - Peak	93	-	42	11	-	26	42	11	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	

Key to Impacts	Noticeable	Clearly Audible	Moderately Intrusive	Highly Intrusive

Note 1: Highly noise affected, based on ICNG definition (i.e. predicted $L_{Aeq(15minute)}$ noise at residential receiver is 75 dBA or greater).

Note 2: Based on worst-case predicted noise levels.

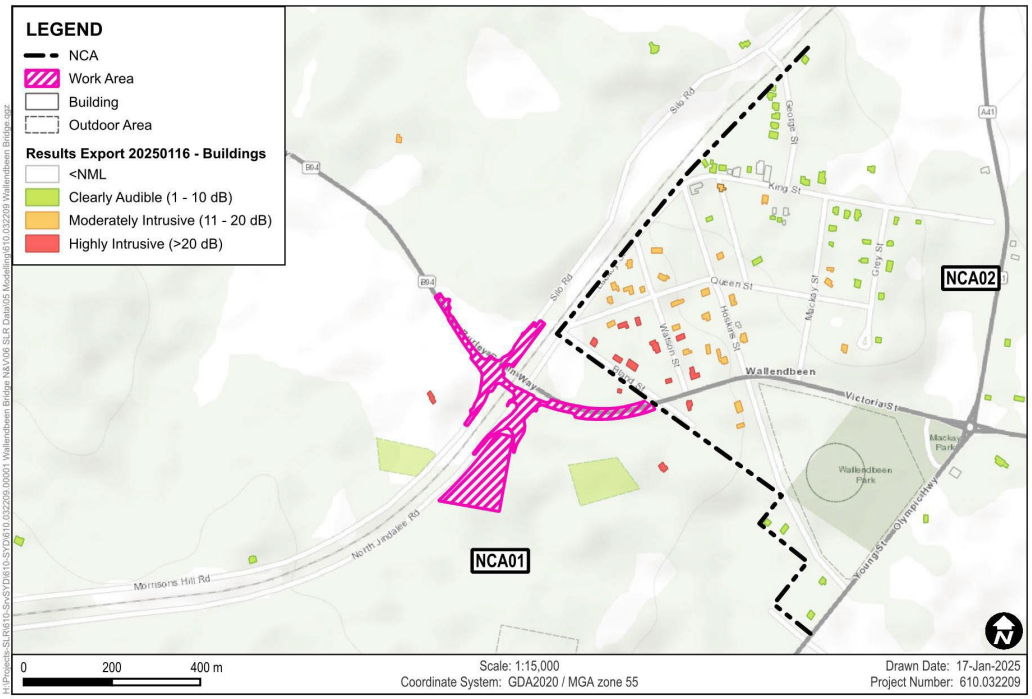


Figure 6-4 Predicted Noise Impacts During Peak Phase of *Site Establishment and Early Works (daytime)*

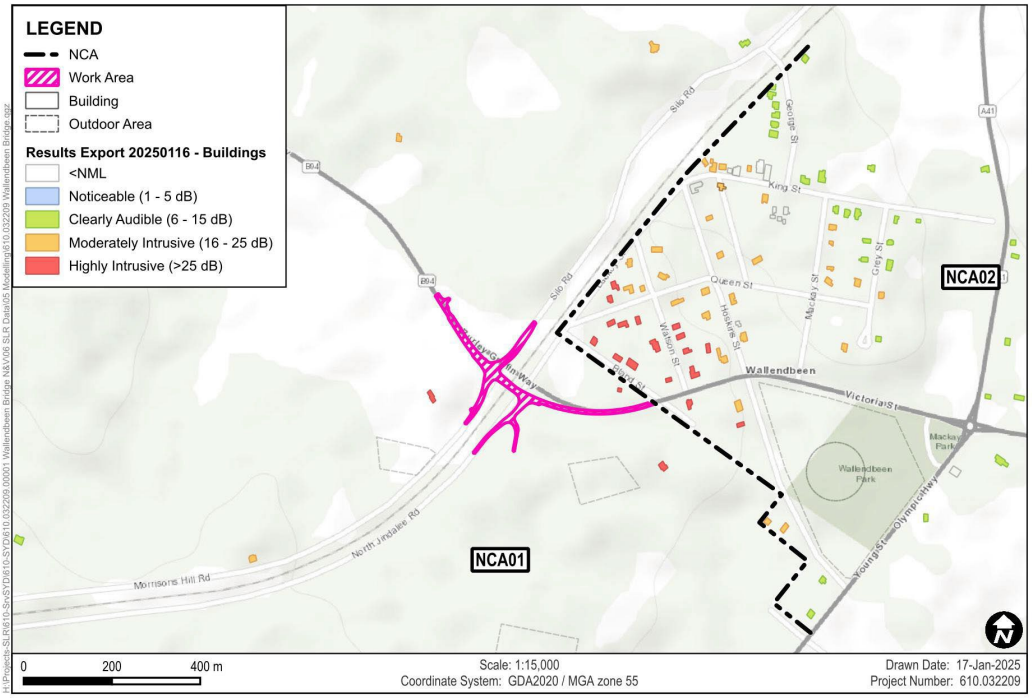


Figure 6-5 Predicted Noise Impacts During Peak Phase of *Road Works* (nighttime)

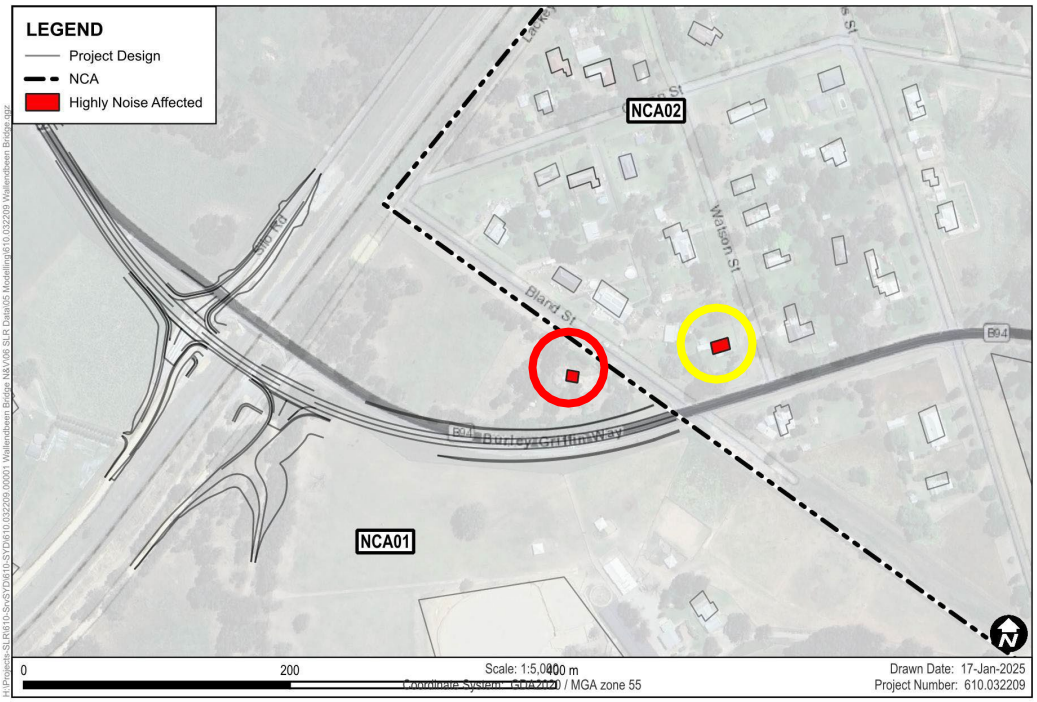


Figure 6-6 Highly noise-affected residential receivers

Vibration

The Assessment also considered potential impacts from construction vibration on nearby receivers, in both the context of structural cosmetic damage and human comfort.

For the proposed plant and equipment proposed to be used to undertake the works, the minimum working distance to prevent cosmetic damage was deemed 20m (based on a vibratory roller), and the minimum working distance for human comfort was 100m. The results of this assessment are shown in Figure 6-7, No receivers are within the 20m buffer for cosmetic damage, and there are six receivers within the 100m buffer for human comfort.

Where impacts are perceptible, it is likely that this would only be for short durations of time when vibration intensive equipment is nearby. Any vibration-related impacts would be mitigated through the implementation of the safeguards outlined in Section 6.4.4.

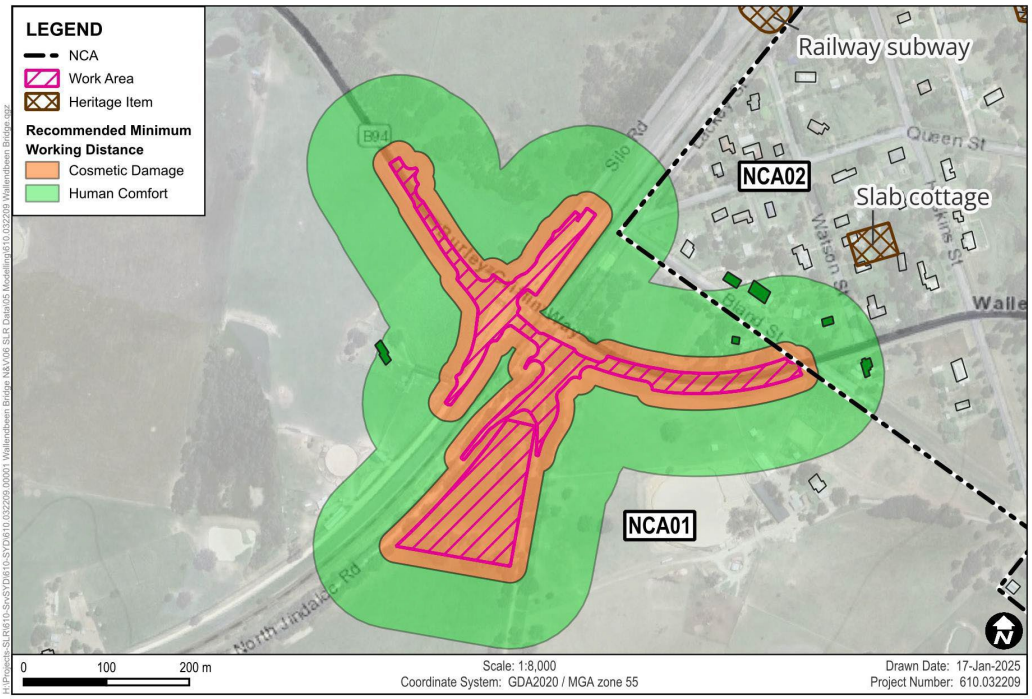


Figure 6-7 Minimum working distances for construction vibration

Construction traffic

The Assessment also considered impacts of noise from traffic associated with the proposed works using the *Calculation of Road Traffic Noise* (CoRTN) algorithm.

The construction traffic noise assessment took a conservative approach, assuming the proposal would require 50 light vehicles and 50 heavy vehicles accessing the site per day. The Assessment found that construction traffic was unlikely to increase local noise levels above the threshold set by the *Road Noise Policy* (RNP) (See Table 6-11).

Table 6-11 Construction traffic noise

Road	Vehicle movements								Predicted L_{Aeq} Noise Increase, dB	
	Existing				Construction[1]					
	Daytime		Night-time		Daytime		Night-time		Daytime	Night-time
	LV	HV	LV	HV	LV	HV	LV	HV		
Burley Griffin Way	800	327	46	57	25	40	25	10	0.4	0.8
Olympic Highway	1,967	646	166	89	25	40	25	10	0.2	0.5

Note 1: It is assumed that all construction vehicle movements may use both Olympic Highway and Burley Griffin Way. It is assumed that the half of the construction light vehicle movements occur during the night-time period due to workers potentially arriving before 7am. It is assumed that the majority of construction heavy vehicle movements occur during the daytime period.

Operation

Noise

The proposal is not intended to increase traffic volumes in the community, as such, it is not anticipated for traffic noise volumes increase above the 2 dB(A) threshold set by the CNVG. This was demonstrated in the Noise and Vibration Impact Assessment that showed under both current and future (2035) scenarios, there would be an increase in noise to nearby residential receivers of less than 1 dB(A).

There would also be negligible impact on the nearby 'other' sensitive receivers.

Maximum noise events are a feature of the traffic at this location with events ranging from 200 to 300 events per night as monitored in November 2024. The approved bridge and proposed additional road alterations are not designed to increase traffic volumes at this location. As such it is not expected to increase the occurrence of maximum noise level events.

Vibration

There would be no increase in vibration caused by ongoing operation of the proposal, hence, no additional mitigation measures are required.

6.4.4 Safeguards and management measures

It is assumed that all relevant standard mitigation measures outlined in Appendix B of the Construction Noise and Vibration Guideline would be implemented.

The Noise and Vibration Impact Assessment outlined additional mitigation measures that would be required where feasible and reasonable. These measures are presented below in Table 6-12.

Table 6-12 Additional mitigation measures

Predicted Airborne ($L_{Aeq, 15min}$) Noise Level at Receiver			Additional Mitigation Measures
Perception	dBA above RBL	dBA above NML	Type[1]
All hours			
75 dBA or greater			N, V, PC, RO
Approved Hours: Mon - Fri (7am - 6pm), Sat (8am - 6pm), Sun/Pub Hol (Nil)			
Noticeable	5 to <10	0	-
Clearly Audible	10 to <20	<10	-
Moderately Intrusive	20 to 30	10 to 20	N, V
Highly Intrusive	> 30	> 20	N, V
OOHW Period 1: Mon - Fri (6pm - 10pm), Sat (7am - 8am and 6pm - 10pm), Sun/Pub Hol (8am - 6pm)			
Noticeable	5 to <10	< 5	-
Clearly Audible	10 to <20	5 to <15	N, R1, DR
Moderately Intrusive	20 to 30	15 to 25	V, N, R1, DR
Highly Intrusive	> 30	> 25	V, IB, N, R1, DR, PC, SN
OOHW Period 2: Mon - Fri (10pm - 7am), Sat (10pm - 8am), Sun/Pub Hol (6pm - 7am)			
Noticeable	5 to <10	< 5	N
Clearly Audible	10 to <20	5 to <15	V, N, R2, DR
Moderately Intrusive	20 to 30	15 to 25	V, IB, N, PC, SN, R2, DR

Predicted Airborne ($L_{Aeq, 15min}$) Noise Level at Receiver			Additional Mitigation Measures
Highly Intrusive	> 30	> 25	AA, V, IB, N, PC, SN, R2, DR

N = Notification, SN = Specific Notification, PC = Phone Calls, IB = Individual Briefings, R1 = Respite Period 1, R2 = Respite Period 2, RO = Project Specific Respite Offer, DR = Duration Respite, AA = Alternative Accommodation, V = Verification.

Note, if night works are not deemed necessary to undertake works (i.e., works are only done during standard hours and Saturday 1Pm to 6PM) then the additional mitigation measures for OOHW P2 will not be required.

To summarise, the below, project-specific mitigation measures would be required:

- A Construction Noise Management Plan will be completed implementing mitigation measures outlined in the Noise and Vibration Impact Assessment prepared by SLR, including:
  - A letterbox drop for all affected receivers to provide information about the nature of works to be performed and the potential impacts of noise from the works.
  - Phone calls to the relevant highly noise affected receivers with personalised contact and tailored advice, with the opportunity to provide comments on the proposed work and their specific needs.
  - If works are unable to comply with Respite periods which would limit works to two or three consecutive nights, Duration Respite (DR) agreements with affected receivers will be sought.
  - Verification of measurements are recommended to be undertaken shortly after commencement of construction works to confirm noise levels are consistent with those predicted in the Assessment and that appropriate mitigation measures have correctly been implemented.
  - If night works are required, performing the noisiest works prior to 12AM, and quieter works from 12AM onwards.
- Where noise intensive equipment is to be used near sensitive receivers, the work should be scheduled for Standard Construction Hours, where possible. If it is not possible to restrict the work to the daytime, then they should be completed as early as possible in each work shift.
- Appropriate respite should also be provided to affected receivers in accordance with the CNVG.
- Hoarding, or other shielding structures (site shed, earth bund, etc), should be considered near compounds or fixed work areas with long durations where practicable. To provide effective noise mitigation, the shielding structure should break line-of-sight from the nearest receivers to the work and be of solid construction with minimal gaps.
- Limit the use of engine compression brakes in residential areas, particular at night. Ensure vehicles are fitted with a maintained Original Equipment Manufacturer exhaust silencer or a silencer that complies with the National Transport Commission's 'In-service test procedure' and standard.
- Consider the use of non-tonal reverse beepers and ambient sensitive alarms (that adjust noise output relative to the ambient level) where practicable.
- Switching off plant and equipment when not in use.

6.5 Other impacts

6.5.1 Existing environment and potential impacts

Environmental factor	Existing environment	Potential impacts
Waste and resource use	The existing waste environment is in keeping with the rural residential character of the locality. There is little waste or litter present, with the general area being kept in a clean manner.	No additional impacts to those outlined in the project REF would be expected.
Air Quality	Air quality in the Riverina region is generally good with seasonal variations related to dry weather, agricultural emissions, burning of agricultural residues or solid fuels in domestic heating.	No additional impacts to those outlined in the project REF would be expected
Traffic and Access	Burley Griffin Way is a main road that provides an important link between Griffith, Yass and Sydney. There are currently traffic disruptions in place that result in delays and detours for the local community due the current, temporary single-lane bridge.	No additional negative impacts to those outlined in the project REF would be expected The proposal would have an overall positive impact on connectivity for the local and wider community by restoring road access and facilitating the future double-stacking of containers on the Main Southern Railway line.
Aboriginal Heritage	An Aboriginal Due Diligence Assessment was undertaken by NGH, which included a site visit by a qualified archaeologist from NGH. Additional areas assessed in this addendum REF were assessed in accordance with Stage 2 of the Transport for NSW Procedure for Aboriginal Cultural Heritage Consultation and Investigation (PACHCI) procedure. No known Aboriginal objects are located within or in close proximity to the proposal area	As outlined in the Aboriginal Due Diligence and Stage 2 PACHCI report, the proposed works are unlikely to have impacts on any Aboriginal heritage objects.
Non-Aboriginal Heritage	The township of Wallendbeen contains 19 heritage items listed on the Cootamundra Local Environment Plan 2013. The closest heritage item is a Slab Cottage, located approximately 158m from the proposal area	No additional impacts to those outlined in the project REF would be expected
Socio-economic	Traffic signals on either side of the temporary overbridge maintain delays for local road users, who otherwise face 40-minute detours.	The proposal would restore road connectivity for local road users leading to overall positive impacts. No other impacts to those already discussed in the project REF would be expected.
Visual Impacts	The dominant visual characteristics of the region include forested landscapes, agricultural land (dryland cropping, irrigation and grazing) and gently rolling hills. Dominant built features within the locality include the township of Wallendbeen, nearby farm buildings and sheds, the Main Southern Railway line and major roads such as the Burley Griffin Way	No additional visual impacts during the construction phase to those outlined in the project REF would be expected. The raised road profile may be considered by some local residents to be an impact during the operational phase of the proposal, however this is necessary to achieve the project outcomes and would be mitigated through the measures outlined in the project REF.

6.5.2 Safeguards and management measures

Impact	Environmental safeguards	Responsibility	Timing	Reference
Aboriginal Heritage	If any items suspected of being Aboriginal in origin are discovered during the work, all work in the immediate vicinity must stop and Transport's Unexpected Heritage Items Procedure must to be followed In the unlikely event that human remains are identified, all work must cease in the immediate vicinity and Transport's Unexpected Heritage Items Procedure must to be followed.	Construction Manager	Construction	Transport's Unexpected Heritage Items Procedure
No other safeguard or management measures to those outlined in the project REF are required				

6.6 Cumulative impacts

6.6.1 Potential impacts

A search of the NSW Major Projects Portal on the 15th of January found that there are no new projects that would pose to have cumulative impacts with the proposal. Cootamundra-Gundagai Regional Council does not provide a DA Tracker, and a search of the NSW Planning Portal was unable to return results for any Development Applications that may pose a cumulative impact with the proposal. However, it is unlikely that any DAs within the locality would pose a cumulative impact.

6.6.2 Safeguards and management measures

No additional safeguards or mitigation measures are considered necessary.

7. Environmental management

7.1 Environmental management plans (or system)

A number of safeguards and management measures have been identified to minimise adverse environmental impacts, including social impacts, which could potentially arise as a result of the proposed modification. Should the proposed modification proceed, these management measures would be addressed if required during detailed design and incorporated into the Contractors Environmental Management Plan (CEMP) and applied during the construction and operation of the proposed modification.

7.2 Summary of environmental safeguards and management measures

Environmental safeguards and management measures for the Wallendbeen Bridge over Rail are summarised in Table 7-1. Additional safeguards and management measures identified in this addendum REF are included in bold and italicised font. The safeguards and management measures will be incorporated into the detailed design phase of the proposed modification, the CEMP and implemented during construction and operation of the proposed modification, should it proceed. These safeguards and management measures will minimise any potential adverse impacts arising from the proposed works on the surrounding environment.

Table 7-1: Summary of safeguards and management measures

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing	Reference
1	Topography, geology and soils	If contaminated areas are encountered during construction, appropriate control measures will be implemented to manage the immediate risks of contamination. All other works that may impact on the contaminated area will cease until the nature and extent of the contamination has been confirmed and any necessary site-specific controls or further actions identified in consultation with the Environmental Manager/Officer and/or EPA	Construction Manager	Construction	
2		A site-specific emergency spill plan will be developed and include spill management measures in accordance with relevant EPA guidelines. The plan will address measures to be implemented in the event of a spill, including initial response and containment, notification of emergency services and relevant authorities Spill kits would be available onsite, and all staff would be aware of their location and trained in their use		Pre-construction and construction	
3		A progressive erosion and sediment control plan is to be prepared for the works. The ESCP should outline what Erosion and sediment control measures are to be implemented and maintained to: • Prevent sediment moving off-site and sediment laden water entering any watercourse, drainage lines, or drains inlets to reduce water velocity and capture sediment on site • Minimise the amount of material transported from site to surrounding pavement surfaces Erosion and sedimentation controls are to be checked and maintained on a regular basis (including clearing of sediment from behind barriers) and records kept and provided on request		Pre-construction and construction	"The Blue Book"

		Erosion and sediment control measures are not to be removed until the works are completed, and areas are stabilised Work areas are to be stabilised progressively during the works			
4		Divert clean water around the site (in accordance with the Landcom/Department of Housing Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book)		Construction	

5	Asbestos Finds	• Dust suppression should be undertaken during soil disturbance as a matter or precaution.
		• Prior to starting construction worker awareness training should be undertaken to identify indicator minerals/rocks that may be asbestiform.
		• If asbestiform and/or indicator minerals and/or textures are encountered or suspected during excavation works, work is to stop in the area and management be alerted. The area will be isolated with a 10-metre exclusion zone and sign posted, access will be restricted, and specialist geological and occupational hygiene advice will be sought prior to further progressing work in that area.
		• Any geotechnical investigations for NOA will be undertaken by a suitably qualified and experienced person in accordance with guidelines made or approved under the Work Health and Safety Act 2011 and Workplace Health and Safety Regulations 2017.
		• If confirmed onsite, a Work Health and Safety Asbestos Management Plan would be required prior to works recommencing. The plan would include:
		  • worker awareness training
		  • access to the worksite will be controlled
		  • continuous air monitoring conducted
		  • hygiene protocols will be implemented
		  • appropriate PPE will be worn and suitable filters fitted to plant
		  • appropriate material management processes will be in place
		  • materials will be managed so as to minimise dust generation.
			Construction Manager	Construction	

6	Hydrology, catchment values and water quality	A Soil and Water Management Plan (SWMP) will be prepared and implemented as part of the Contractors Environment Management Plan (CEMP). The SWMP will identify all reasonably foreseeable risks relating to soil erosion and water pollution and describe how these risks will be addressed during construction	Construction Manager	Pre-construction and construction	
7		All fuels, chemicals and lubricants are to be stored in an impervious doubled bunded area within the site compound area and at least 200 m away from any watercourse. Refuelling of plant and equipment is to occur in impervious double bunded areas within the site compound		Construction	
8		Adequate incident management procedures will be incorporated into the CEMP, including requirement to notify EPA for incidents that cause material harm to the environment		Pre-construction and construction	
9		There is to be no release of dirty water into drainage lines and/or waterways		Construction	
10		Measures to control pollutants from stormwater and spills would be investigated and incorporated in the pavement drainage system at locations where it discharges to the receiving drainage lines. Measures aimed at reducing flow rates during rain events and potential scour would also be incorporated in the design of the pavement drainage system		Construction	
11		Monitor Bureau of Meteorology (BoM) forecast heavy rainfall events in order to allow sufficient time to vacate and prepare the site prior to the commencement of heavy rainfall and flood events.		Construction	
12	Waste Minimisation and Management	Waste will be managed in accordance with the CEMP.	Construction Manager and site staff	Construction	
13		Resource management hierarchy principles are to be followed: • Avoid unnecessary resource consumption as a priority. • Avoidance is followed by resource recovery (including reuse of materials, reprocessing, and recycling and energy recovery). • Disposal is undertaken as a last resort (in accordance with the Waste Avoidance and Resource Recovery Act 2001).		Construction	Waste Avoidance and Resource Recovery Act 2001
14		All waste generated by the proposed work to be classified in accordance with the NSW Waste Classification Guidelines Part 1: Classifying Wastes (DECCW 2008).		Construction	NSW Waste Classification Guidelines Part 1:

					Classifying Wastes (DECCW 2008)
15		All waste generated on site is to be transported off site and disposed of at landfill site approved to accept General Solid Waste (non–putrescible).		Construction	
16		Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day. Once the works have been completed, all waste material is to be removed from site and disposed of at a licenced facility. Waste is not to be buried on site.		Construction and post-construction	
17	Climate and Air Quality	Works will be minimised during windy periods to minimise dust creation and ensure no dust impacts occur along public roads or at sensitive receivers. Dust suppression techniques will be utilised in response to visible dust, such as watering dusty work areas and stockpile sites (using non-potable water where available).	Construction Manager and site staff	Construction	
18		All plant and equipment would be ensured to comply with Part 4 of the Protection of the Environment Operations (Clean Air) Regulation 2002. Emissions would be kept within the standards and regulations under the Protection of the Environment Operations Act 1997.		Construction	Protection of the Environment Operations (Clean Air) Regulation 2002 AND Protection of the Environment Operations Act 1997
19		All delivery vehicles would be covered during transportation.		Construction	
20		Vegetation or other materials will not be burnt on site.		Construction	
21	Noise and Vibration	A Construction Noise Management Plan will be completed implementing mitigation measures outlined in the Noise and Vibration Impact Assessment prepared by SLR, including: • A letterbox drop for all affected receivers to provide information about the nature of works to be performed and the potential impacts of noise from the works. • Phone calls to the relevant highly noise affected receivers with personalised contact and tailored advice, with the opportunity to provide comments on the proposed work and their specific needs.	Construction Manager	Pre-construction	Noise and Vibration Assessment by SLR AND Construction Noise and Vibration Guidelines (Transport)

		• If works are unable to comply with Respite periods which would limit works to two or three consecutive nights, Duration Respite (DR) agreements with affected receivers will be sought. • Verification of measurements are recommended to be undertaken shortly after commencement of construction works to confirm noise levels are consistent with those predicted in the Assessment and that appropriate mitigation measures have correctly been implemented. • If night works are required, performing the noisiest works prior to 12AM, and quieter works from 12AM onwards			
22		Where noise intensive equipment is to be used near sensitive receivers, the work should be scheduled for Standard Construction Hours, where possible. If it is not possible to restrict the work to the daytime, then they should be completed as early as possible in each work shift.		Construction	
23		Appropriate respite should also be provided to affected receivers in accordance with the CNVG.		Construction	
24		Hoarding, or other shielding structures (site shed, earth bund, etc), should be considered near compounds or fixed work areas with long durations where practicable. To provide effective noise mitigation, the shielding structure should break line-of-sight from the nearest receivers to the work and be of solid construction with minimal gaps.		Construction	
25		Limit the use of engine compression brakes in residential areas, particular at night. Ensure vehicles are fitted with a maintained Original Equipment Manufacturer exhaust silencer or a silencer that complies with the National Transport Commission's 'In-service test procedure' and standard.		Construction	
26		Consider the use of non-tonal reverse beepers and ambient sensitive alarms (that adjust noise output relative to the ambient level) where practicable		Construction	
27		Switching off plant and equipment when not in use		Construction	
28		Avoid operating plant concurrently.		Construction	
29		Briefing of the work team to raise awareness of the proximity of sensitive receivers and the importance of minimising noise emissions.		Pre-construction	
30	Aboriginal Heritage	If any items suspected of being Aboriginal in origin are discovered during the work, all work in the immediate vicinity must stop and Transport's Unexpected Heritage Items Procedure must to be followed	Construction Manager	Construction	Transport's Unexpected Heritage Items Procedure

31		In the unlikely event that human remains are identified, all work must cease in the immediate vicinity and Transport's Unexpected Heritage Items Procedure must to be followed.			
32	Historic Heritage	In the event that any unexpected heritage items, archaeological remains or potential relics of Non–Aboriginal origin are encountered during construction works, works would cease at the location. The find would be immediately reported to the local council, and the regulator in accordance with legislation. No work would commence in the vicinity of the find until any required approvals have been given by the regulator.	Construction Manager	Construction	
33	Traffic and Access	Existing access for adjoining properties and roads would be maintained at all times during the works, unless otherwise agreed to by the affected property owner	Construction Manager	Construction	
34		Local road users would be informed of any expected traffic or access changes and delays prior to construction commencing.		Pre-construction	
35		All complaints are to be recorded on a Complaints Register and attended to promptly.		Construction	
36	Biodiversity	Unexpected threatened species finds: The site induction should include measures to make employees aware of potential threatened flora and fauna during works and understand the procedures if threatened fauna are detected. This would be recorded as a part of the induction procedure and toolbox talks.	Construction Manager	Construction	Biodiversity Management Guidelines
37		All woodland to be removed is to be surveyed by an ecologist or suitably qualified person, to record and relocate the presence of any nesting fauna.		Construction	
38		No HBTs would be removed during the proposed works. If the proposed design changes to include mature or HBT removal, further assessment would be required prior to commencement of work		Construction	
39		Vegetation to be retained within the proposal area is to be clearly marked.		Pre-Construction	
40		All fallen timber within the proposal area is to be relocated from the development footprint to an adjacent area.		Construction	
41		All weed material containing seed heads, weeds that contain toxins, and weeds that are able to reproduce vegetatively should be disposed of at an appropriate		Construction	

		waste management facility or otherwise properly treated to prevent weed growth.			
42		All herbicides should be used in accordance with the requirements on the label. Any person undertaking pesticide (including herbicide) application should be trained to do so and have the proper certificate of completion/ competency or statement of attainment issued by a registered training organisation		Construction	
43		Plant equipment and machinery should be cleaned of all biological matter prior to entering the site.		Construction	
44		If threatened fauna or flora species are discovered unexpectedly, stop works immediately and follow the Transport Unexpected Threatened Species Find Procedure contained in the Transport Biodiversity Guidelines – Guide 1 (Pre-clearing process (EMF-BD-GD-0032).		Construction	
45		Vegetation removal will be undertaken in accordance with Guide 4: Clearing of vegetation and removal of bushrock of the Transport for NSW Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects (March 2024).		Construction	
46		Exclusion zones will be set up at the limit of clearing in accordance with Guide 2: Exclusion zones of the Transport for NSW Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects (March 2024).		Construction	
47		Weed species will be managed in accordance with Guide 6: Weed management of the Transport for NSW Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects (March 2024).		Construction	
48	Visual Impacts	Working areas and the compound site are to be kept tidy, free of rubbish and cleaned up at the end of each working day.	Construction Manager and site staff	Construction	
~~49~~		Rehabilitation works will take place as soon as possible following the completion of construction. • The existing road surface of the redundant road will be removed as part of rehabilitation. • Topsoil removed from the construction area will stockpiled for reuse during site rehabilitation		Post-construction	

		• Rehabilitation of disturbed areas post completion of works will aim to facilitate habitat recovery. This includes revegetation with suitable native vegetation.			
50		Remove temporary erosion and sediment controls from the site once landforms have been assessed as stable.		Post-construction	
	Socioeconomic Impacts	No additional safeguards were considered necessary.			
	Cumulative Impacts	No additional safeguards were considered necessary.			

7.3 Licensing and approvals

All relevant licenses, permits, notifications and approvals needed for Wallendbeen Road over Rail Bridge and when they need to be obtained are listed in Table 7-2. Additional or changed licenses and approval requirements identified in this addendum REF are indicated by underlined and/or struck out font.

Table 7-2: Summary of licensing and approval required

Instrument	Requirement	Timing
Water supply work approval for equipment to extract water from Cunningham Creek	Yes	Before water extraction works begin – Transport has commenced process.

8. Conclusion

8.1 Justification

8.1.1 Social factors

This addendum REF and design of the updated bridge and road design has been undertaken in conjunction with and in response to community consultation, a summary of consultation is provided in Section 5. No additional impacts to those outlined in the project REF are expected in this addendum REF.

8.1.2 Biophysical factors

The increase to the proposal area from that outlined in the project REF would require some additional clearing of woodland. This impact has been assessed and is deemed to be not significant.

8.1.3 Economic factors

No additional economic impacts to those in the project REF are expected as part of the proposal.

8.1.4 Public interest

Overall, the proposal would have a net positive impact that is in line with public interest. On completion, the proposal would act to re-establish the east-west connection along Burley Griffin Way and facilitate double stacking of freight containers on the Main Southern Railway line.

8.2 Objects of the EP&A Act

Object	Comment
1.3(a) To promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources.	Reestablishment of road and improvements to rail transport will promote social and economic welfare by reinstation connectivity between communities. This will be done through the proposal, which would employ the mitigation measures outlined in this report to minimise impacts on the environment.
1.3(b) To facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment.	This addendum REF has considered economic, environmental and social impacts, and where necessary, provided mitigation measures to reduce or remove impacts.
1.3(c) To promote the orderly and economic use and development of land.	Reestablishing connectivity
1.3(d) To promote the delivery and maintenance of affordable housing.	Not relevant to the project.
1.3(e) To protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats.	Additional impacts on biological factors in the locality as a result of the addendum works have been assessed as not being significant.
1.3(f) To promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage).	Assessed as not having any significant risks in the addendum works

1.3(g) To promote good design and amenity of the built environment.	Flattened batters and safer intersections as a result of addendum works demonstrate good design and amenity of the completed proposal
1.3(h) To promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants.	Not relevant to the project.
1.3(i) To promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State.	Not relevant to the project.
1.3(j) To provide increased opportunity for community participation in environmental planning and assessment.	Consultation allowed for community participation in the proposal.

8.3 Ecologically sustainable development

8.3.1 The precautionary principle

According to the precautionary principle, if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

This REF has been prepared utilising the precautionary principle. That is, if threats are perceived as possibly leading to serious or irreversible environmental damage, then either the proposed works would not go-ahead, or the development would be modified to ensure that such serious threats do not exist. The assessment of potential risks associated with the proposed works assessed in this REF are considered to be adequately manageable.

8.3.2 Intergenerational equity

Intergenerational and intra-generational equity requires that the present generation will ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of the present and future generations. The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.

It is unlikely that the proposed works would impact on natural features to a level that would impact on the health, diversity or productivity of the environment to a level that would impact on future generations.

8.3.3 Conservation of biological diversity and ecological integrity

Conversation of biological diversity and ecological integrity are fundamental consideration of ESD.

An assessment of the existing local environment has been undertaken in order to identify and manage any potential impacts of the proposal on local biodiversity. The impacts of the proposal on local populations of threatened species and communities has been assessed as not significant.

8.3.4 Improved valuation, pricing and incentive mechanisms

This principle requires that “costs to the environment should be factored into the economic costs of a proposal”.

This REF has examined the environmental consequences of the proposal and identified mitigation measures for factors which have the potential to experience adverse impacts. The implementation of these mitigation measures would increase both the capital and operating costs of the proposal. This signifies that environmental resources have been given appropriate valuation.

8.4 Conclusion

This addendum REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity.

This has included consideration where relevant, of conservation agreements and plans of management under the NPW Act, biodiversity stewardship sites under the BC Act, wilderness areas, areas of outstanding value, impacts on threatened species, populations and ecological communities and their habitats and other protected fauna and native plants. It has also considered potential impacts to matters of national environmental significance listed under the Federal EPBC Act.

A number of potential environmental impacts from the proposed modification have been avoided or reduced during the design development and options assessment. The proposed modification as described in the addendum REF best meets the project objectives but would still result in some impacts on nearby sensitive receivers through noise generated during construction. Safeguards and management measures as detailed in this addendum REF would ameliorate or minimise these expected impacts. The proposed modification would also improve safety and connectivity between communities around the Wallendbeen area, and facilitate future double-stacking of freight containers on the Main Southern Railway line. On balance the proposed modification is considered justified, and the following conclusions are made.

8.4.1 Significance of impact under NSW legislation

The proposed modification would not result in a change to the findings of the project REF and would be unlikely to cause a significant impact on the environment. Therefore, it is not necessary for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning under Division 5.2 of the EP&A Act. A Biodiversity Development Assessment Report or Species Impact Statement is not required. The proposed modification is subject to assessment under Division 5.1 of the EP&A Act. Consent from Council is not required.

8.4.2 Significance of impact under Australian legislation

The proposed modification would not likely cause a significant impact on matters of national environmental significance or the environment of Commonwealth land within the meaning of the EPBC Act. A referral to the Australian Government Department of Climate Change, Energy, the Environment and Water is not required.

9. Certification

This addendum review of environmental factors provides a true and fair review of the proposed modification in relation to its potential effects on the environment. It addresses to the fullest extent possible all matters affecting or likely to affect the environment as a result of the proposed modification.

Michael Suidgeest
Environment and Sustainability Manager South
Transport for NSW

Date:26.02.2025

I have examined this addendum review of environmental factors and accept it on behalf of Transport for NSW.

Russell Farnell
Senior Project Manager
Transport for NSW

Date: 26/02/2025

10. EP&A Regulation publication requirement

Respondent	Yes/No
Does this REF need to be published under section 171(4) of the EP&A Regulation?	Yes

11. Terms and acronyms used in this addendum REF

Term /acronym	Description
AusLink	Mechanism to facilitate cooperative transport planning and funding by Commonwealth and state and territory jurisdictions
BC Act	*Biodiversity Conservation Act 2016 (NSW).*
CEMP	Construction / Contractor's environmental management plan
EIA	Environmental impact assessment
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW). Provides the legislative framework for land use planning and development assessment in NSW
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth). Provides for the protection of the environment, especially matters of national environmental significance, and provides a national assessment and approvals process.
ESD	Ecologically sustainable development. Development which uses, conserves and enhances the resources of the community so that ecological processes on which life depends, are maintained and the total quality of life, now and in the future, can be increased
FM Act	*Fisheries Management Act 1994* (NSW)
Heritage Act	*Heritage Act 1977* (NSW)
LALC	Local Aboriginal Land Council
LEP	Local Environmental Plan. A type of planning instrument made under Part 3 of the EP&A Act.
LoS	Level of Service. A qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers.
NES	Matters of national environmental significance under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.*
NPW Act	National Parks and Wildlife Act 1974 (NSW)
Roads and Maritime	NSW Roads and Maritime was dissolved by the Transport Administration Amendment Bill in August 2019, all function are now managed by Transport for NSW
SEPP	State Environmental Planning Policy. A type of planning instrument made under Part 3 of the EP&A Act.
SEPP (Biodiversity and Conservation)	State Environmental Planning Policy (Biodiversity and Conservation) 2021
SEPP (Planning Systems)	State Environmental Planning Policy (Planning Systems) 2021
SEPP (Precincts – Central River City)	State Environmental Planning Policy (Precincts – Central River City) 2021
SEPP (Precincts – Eastern Harbour City)	State Environmental Planning Policy (Precincts – Eastern Harbour City) 2021
SEPP (Precincts – Regional)	State Environmental Planning Policy (Precincts – Regional) 2021

SEPP (Precincts – Western Parkland City)	State Environmental Planning Policy (Precincts –Western Parkland City) 2021
SEPP (Resilience and Hazards)	State Environmental Planning Policy (Resilience and Hazards) 2021
SEPP (Transport and Infrastructure)	State Environmental Planning Policy (Transport and Infrastructure) 2021
TSC Act	*Threatened Species Conservation Act 1995* (NSW)
QA Specifications	Specifications developed by Roads and Maritime Services for use with road work and bridge work contracts let by Transport for NSW.

12. References

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NSW Government. (n.d.). *SEED Map*. Retrieved from The Central Resource for Sharing and Enabling Environmental Data NSW.

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Appendix A Biodiversity background searches

A.1 BioNet results

Threatened species recorded within 10km of the proposal area (BioNet, 2024).

Scientific	Common Name
Artamus cyanopterus cyanopterus	Dusky Woodswallow
Polytelis swainsonii	Superb Parrot
Oxyura australis	Blue-billed Duck
Glossopsitta pusilla	Little Lorikeet
Neophema pulchella	Turquoise Parrot
Keyacris scurra	Key's Matchstick Grasshopper

A.2 **Species list**

Common Name	Scientific Name	Observed (O)/Heard (H)	Conservation Status	Date observed/heard
Red Wattlebird	*Anthochaera carunculata*	O		2021
White-winged chough	*Corcorax melanorhamphos*	O		2021
Australian Raven	*Corvus coronoides*	O		2021
Laughing Kookaburra	*Dacelo novaeguineae*	O		2021
Galah	*Eolophus roseicapilla*	O		2021
Australian Magpie	*Gymnorhina tibicen*	O		2021, 2024
Noisy Miner	*Manorina melanocephala*	O		2024
Eastern rosella	*Platycercus eximius*	O		2024
Striated Pardalote	*Pardalotus striatus*	H		2024
Grey-shrike Thrush	*Colluriincia harmonica*	H		2024
Superb Parrot	*Polytelis swainsonii*	O	Vulnerable (BC Act) Vulnerable (EPBC Act)	2021
Pied Currawong	*Strepera graculina*	O		2021
Mammals				
Eastern Grey Kangaroo	*Macropus giganteus*	O		2021
Amphibians				
Eastern Sign Bearing Froglet	*Crinia parinsignifera*	H		2021

Exotic	Scientific Name	Common Name
Trees and Shrubs		
	Eucalyptus blakelyi	Blakely's Red Gum
	Eucalyptus melliodora	Yellow Box
	Brachychiton populneus	Kurrajong
*	Pinus spp.	
	Eucalyptus spp.	
*	Rubus spp.	Blackberry
	Acacia baileyana	Cootamundra Wattle
	Acacia implexa	Hickory Wattle
*	Chamaecytisus palmensis	Tree Lucerne

*	Photinia spp.	
*	Prunus sp.	Plum
*	Crataegus monogyna	Hawthorn
Forbs		
*	Arctotheca calendula	Capeweed
*	Briza minor	Shivery Grass
	Calotis cuneata	Mountain Burr-Daisy
*	Conyza bonariensis	Flaxleaf Fleabane
	Crassula sp.	Stonecrop
*	Echium plantagineum	Patterson's Curse
*	Erodium spp.	Crowfoot
*	Fumaria officinalis	Common Fumitory
*	Galium spp.	
	Hardenbergia violacea	
	Hypochaeris radicata	Catsear
*	Onopordum acanthium subsp. acanthium	Scotch Thistle
	Oxalis spp.	
*	Plantago lanceolata	Lamb's Tongues
*	Romulea rosea	Onion grass
*	Rumex acetosella	Sheel Sheep Sorrel
*	Rumex spp.	Dock
*	Salvia spp.	
*	Sanguisorba minor	Sheep's Burnet
*	Silybum marianum	Variegated Thistle
*	Sonchus oleraceus	Common Sowthistle
*	Stellaria media	Common Chickweed
*	Trifolium	Saffron Thistle
*	Trifolium arvense	Haresfoot Clover
*	Trifolium repens	White Clover
*	Verbena bonariensis	Purpletop
	Vittadinia spp.	Fuzzweed
*	Hypericum perforatum	St John’s wort
*	Onopordum acanthium	Scotch thistle
Grasses		
	Austrostipa scabra	Speargrass
*	Avena fatua	Wild Oats
	Chloris truncata	Windmill Grass
	Cynodon dactylon	Common Couch
*	Dactylis glomerata	Cocksfoot
*	Eragrostis spp.	A Lovegrass
*	Paspalum dilatatum	Paspalum
*	Phalaris aquatica	Phalaris
	Rytidosperma spp.	
	Themeda triandra	Kangaroo Grass

*	Vulpia myuros	Rat's Tail Fescue
	Austrostipa aristiglumis	Plains Grass
*	Briza maxima	Quaking grass
	Elymus scaber	Common wheat grass
*	Triticum aestivum	Common wheat
*	Holcus lanatus	Fog
*	Lolium sp.	Rye grass
Graminoids		
	Juncus spp.	A Rush
	Dianella spp.	
	Cyperus spp.	

Appendix B Section 171(2) checklist

In addition to the requirements of the Is an EIS required? (1995/1996) guideline and the *Roads and Related Facilities EIS Guideline* (DUAP, 1996) as detailed in the addendum REF, the following factors, listed in section 171(2) of the Environmental Planning and Assessment Regulation 2021, have also been considered to assess the likely impacts of the proposed modification on the natural and built environment.

Factor	Impact
Any environmental impact on a community? The proposal may have an impact on nearby residents through the emission of dusts and other pollutants during construction, but impacts would be mitigated by safeguards outlined in Section 7.2. There would be noise, and potential vibration impacts on nearby sensitive receivers arising from construction. These impacts would be temporary and mitigated through the implementation of the safeguards outlined in Section 7.2.	Short-term minor negative impact
Any transformation of a locality? The proposal would result in a minor-moderate transformation of the locality through the realigned and raised road approaches. There would also be some vegetation clearing.	Long-term minor negative impact
Any environmental impact on the ecosystems of the locality? The proposal would result in the clearing of approximately 0.614ha of native TEC vegetation, however, this clearing has been deemed to not be a significant impact.	Long-term minor negative impact
Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality? There would be a small reduction to the aesthetic value of the locality during construction. This would be temporary and rehabilitated and restored following completion of construction	Short-term minor negative impact
Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations? None of these elements are expected to be impacted by the proposal and the potential impacts would be minimised with the implementation of the safeguards given in Section 7.2.	Nil
Any impact on the habitat of protected fauna (within the meaning of the *National Parks and Wildlife Act 1974*)? No impacts on habitat for protected fauna are expected. Furthermore, no hollow-bearing trees would be removed	Nil
Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air? The proposal would not endanger any species of animal, plant or other form of life, whether living on land, in water or in the air.	Nil.
Any long-term effects on the environment? The proposal is not expected to have any long-term effects on the natural environment as the area would be rehabilitated following completion of construction. The proposal would have impacts on the traffic flow and safety of the human environment through the reestablishment of road networks and improving of rail networks.	Long-term minor positive impact

Factor	Impact
Any degradation of the quality of the environment? The proposal work has the potentially to degrade the quality of the environment in the short-term, for example through accidental spills. No further degradation of the environment is anticipated through vegetation clearing due to prior clearing and disturbance in and around the proposal area However, the potential impacts would be minimised with the implementation of the safeguards given in Section 7.2.	Potential short-term minor negative impact
Any risk to the safety of the environment? The proposal would have minimal risk to the safety of the environment, and any potential impacts would be minimised with the implementation of the safeguards given in Section 7.2.	Potential short-term minor negative impact
Any reduction in the range of beneficial uses of the environment? On completion, all roads within the proposal area would operate as the currently do, albeit with increase safety and sight lines. The completed overbridge would facilitate future double-stacking of containers on the Main Southern Railway line, which the old bridge did not.	Long-term moderate positive impact
Any pollution of the environment? The proposal would not result in any pollution outside the chance of spills during construction. This would be mitigated through the safeguards recommended in Section 7.2.	Potential short-term negative impact.
Any environmental problems associated with the disposal of waste? All wastes generated by the proposal would be contained onsite and removed for disposal either to approved recycling centres or licensed landfills, in line with the safeguards in Section 7.2.	Potential short-term negative impact.
Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply? The proposal would not require any resources that are currently in short supply. Water extraction would be required; however this would be in line with any permits granted by DCCEEW.	Nil
Any cumulative environmental effect with other existing or likely future activities? No cumulative impacts are expected.	Nil
Any impact on coastal processes and coastal hazards, including those under projected climate change conditions? No impacts on coastal hazards would occur.	Nil
Applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1. Cootamundra-Gundagai Regional Council 2022 Community Strategic Plan The proposal would replace the existing temporary bridge with a new bridge that would improve the serviceability and durability of the structure, whilst improving safety for road users. These objectives are in line with Objectives 5.1, regarding improving road networks within the LGA. Additionally, the raised overbridge allows for improved rail freight connections in line with Objects 5.1 and 5.3. NSW Freight and Ports Plan 2018-2023 By facilitating future double-stacking of containers on the Main Southern Railway line, the proposal meets Objective 3 of the Plan.	Long-term moderate positive impact.

Factor	Impact
Other relevant environmental factors	Nil

B.1 Matters of National Environmental Significance and Commonwealth land

Under the environmental assessment provisions of the EPBC Act, the following matters of national environmental significance and impacts on Commonwealth land are required to be considered to assist in determining whether the proposed modification should be referred to the Australian Government Department of Climate Change, Energy, the Environment and Water.

Under the EPBC Act strategic assessment approval a referral is not required for proposed road actions that may affect nationally listed threatened species, populations, endangered ecological communities and migratory species. Impacts on these matters are assessed in detail as part of this addendum REF in accordance with Australian Government significant impact criteria and taking into account relevant guidelines and policies.

Factor	Impact
Any impact on a World Heritage property?	Nil
Any impact on a National Heritage place?	Nil
Any impact on a wetland of international importance?	Nil
Any impact on a listed threatened species or communities? Vegetation clearing required to undertake would have an effect on vegetation associated with Box-Gum Woodland. However, assessment in Section 6.3 concluded that this vegetation does not meet the criteria to be classified part of the TEC	Minor
Any impacts on listed migratory species? No migratory species were recorded during the site survey and are therefore not expected to be impacted.	Nil
Any impact on a Commonwealth marine area?	Nil
Does the proposed modification involve a nuclear action (including uranium mining)?	Nil
Additionally, any impact (direct or indirect) on Commonwealth land?	Nil

Appendix C Threatened Species Evaluations

The tables in this Appendix present the habitat evaluation for threatened species, ecological communities and endangered populations listed for Wallendbeen in the *Bionet Atlas* and those identified as potentially occurring in the area according to the Commonwealth EPBC *Protected Matters Search Tool*[1].

The likelihood of occurrence is based on presence of habitat, proximity of nearest records and mobility of the species (where relevant). The assessment of potential impact is based on the nature of the proposal, the ecology of the species and its likelihood of occurrence. The following classifications are used:

Presence of habitat:

Present: Potential or known habitat is present within the study area

Absent: No potential or known habitat is present within the study area

Likelihood of occurrence

Unlikely: Species known or predicted within the locality but unlikely to occur in the study area

Possible: Species could occur in the study area

Present: Species was recorded during the field investigations

Possible to be impacted

No: The proposal would not impact this species or its habitats. No Assessment of Significance (AoS) is necessary for this species

Yes: The proposal could impact this species or its habitats. An AoS has been applied to these entities.

C.1 Evaluation of the likelihood and extent of impact on threatened flora species

Species	Description of habitat[2]	No. of Records	Presence of habitat	Likelihood of occurrence	Possible impact?
Trees and Shrubs					
Grevillea wilkinsonii *Tumut Grevillea* *BC – CE, EPBC,* *E*	The Tumut Grevillea has a highly restricted distribution in the NSW South- west Slopes region. Its main occurrence is along a 6 km stretch of the Goobarragandra River approximately 20 km east of Tumut where about 1,000 plants are known. The other occurrence is a small population that straddles the boundary of two private properties at Gundagai where only eight mature plants survive. Associated vegetation includes Blakely's Red Gum (*Eucalyptus blakelyi*), Apple Box (*E. bridgesiana*), Yellow Box (*E. melliodora*), and Red Stringybark (*E. macrorhyncha*) and with Kurrajongs (*Brachychiton populneus)* sometimes growing in nearby paddocks.	**0**	**Present** Associated vegetation present within the proposal area.	**Unlikely** This species has a highly restricted distribution. Species was not observed during site visit.	**No** Species unlikely to occur.
Herbs and Forbs					
Cullen parvum Small Scurf- pea BC – E	In known populations in Victoria and NSW, plants are found in grassland, River Red Gum (*Eucalyptus camaldulensis*) Woodland or Box-Gum Woodland, sometimes on grazed land and usually on table drains or adjacent to drainage lines or watercourses, in areas with rainfall of between 450 and 700 mm.	**0**	**Present** Box-Gum woodland occurs at the site.	**Possible** This species is a disturbance specialist.	**Yes** AoS completed
Ammobium craspedioides Yass Daisy BC–V; EPBC – V	Yass Daisies are found in most dry forest communities, Box–Gum woodland, and secondary grassland derived from clearing of these communities. They grow in association with a large range of eucalypts, including Blakely's Red Gum and Yellow Box. Populations can persist in some lightly grazed sites.	**0**	**Present** Box-Gum woodland present in study area.	**Unlikely** No records within the locality.	**No** Species unlikely to occur.

	Found in a number of TSRs.		proposal area disturbed.		

Species	Description of habitat[2]	No. of Records	Presence of habitat	Likelihood of occurrence	Possible impact?
Swainsona recta Small Purple–pea BC–E, EPBC– E	It has been recorded previously at Carcoar, Culcairn and Wagga Wagga but is thought to be extinct from these areas. Populations are still present in Queenbeyan, the ACT and Wellington–Mudgee areas. Plants are commonly found on railway easements. It occurs in the grassy understory of woodlands, and open–forests dominated by Blakely's Red Gum *Eucalyptus blakelyi*, Yellow Box *E. melliodora*, Candlebark Gum *E. rubida* and Long–leaf Box *E. goniocalyx. They are found in dry sclerophyll forests, grasslands, and grassy woodlands.*	**0**	**Present** Box-Gum woodland with Blakely's Red Gum and Yellow Box. proposal area has a history of disturbance.	**Possible** This species is a disturbance specialist.	**Yes** AoS completed
Swainsona murrayana Slender Darling-pea EPBC – V	This species has been found from the Northern Tablelands to the Southern Tablelands and further inland. It is found in Natural Temperate Grassland and Snow Gum *Eucalyptus pauciflora* Woodland, as well as in Box–Gum Woodland and with cypress–pines. It is also found in arid shrublands, Riverine Chenopod Shrublands, dry and wet sclerophyll forests, woodlands and grasslands. Grows in a variety of vegetation types including bladder saltbush, black box and grassland communities on level plains, floodplains and depressions and is often found with *Maireana* species. Plants have been found in remnant native grasslands or grassy woodlands that have been intermittently grazed or cultivated.	**0**	**Present** Box-Gum woodland present within the proposal area.	**Unlikely** No records within the locality. Species was not observed during the site survey.	**No** Species unlikely to occur.
Lepidium aschersonii Spiny Peppercress BC – V, EPBC - V	Found on ridges of gilgai clays dominated by Brigalow (*Acacia harpophylla*), Belah (*Casuarina cristata*), Buloke (*Allocasuarina luehmanii*) and Grey Box (*Eucalyptus microcarpa*). In the south has been recorded growing in Bull Mallee (*Eucalyptus behriana*). Often the understorey is dominated by introduced plants. The species grows as a component of the ground flora, in grey loamy clays. Vegetation structure varies from open to dense, with sparse grassy understorey and occasional heavy litter.	**0**	**Absent** No associated vegetation present within the proposal area.	**Unlikely** No records within the locality	**No** Species was not recorded within the proposal area.
Thesium australe Austral toadflax	Occurs in grassland on coastal heathlands or grassland and grassy woodland away from coastal areas. Often occurs in association with Kangaroo Grass (*Themeda australis*). This species is a root parasite that takes water and some	**0**	**Present** Kangaroo Grass was present	**Unlikely** No records within the	**No** Species is not known to occur in

Species	Description of habitat[2]	No. of Records	Presence of habitat	Likelihood of occurrence	Possible impact?
BC – V, EPBC – V	nutrients from other plants, especially Kangaroo Grass.		within the proposal area.	locality.	the Wallendbeen area.
Leucochrysum albicans subsp. tricolor Hoary Sunray EPBC - E	Occurs in a wide variety of grassland, woodland and forest habitats, generally on relatively heavy soils. Can occur in modified habitats such as semi-urban areas and roadsides. Highly dependent on the presence of bare ground for germination. In some areas, disturbance is required for successful establishment.	**0**	**Present** Bare ground was present within the proposal area.	**Unlikely** No records within the locality. Species was flowering at time of survey – was not detected.	**No** Species unlikely to occur.
Senecio macrocarpus Large-fruit Fireweed EPBC - V	In NSW, Large-fruit Fireweed occurs in partly cleared dry forests and box-gum woodlands which transition to Brittle Gum Forest with a relatively undisturbed understorey of native grasses, forbs and subshrubs (Fallding 2002; R. Rehwinkel 2008, pers. comm.).	**0**	**Present** Box-Gum woodland present within the proposal area.	**Unlikely** proposal area has a history of disturbance. No records within the locality.	**No** Species unlikely to occur.
Orchids					
Prasophyllum petilum Tarengo Leek Orchid EPBC – E; BC – E	Grows in open sites within Natural Temperate Grassland at the Boorowa and Delegate sites. Also grows in grassy woodland in association with River Tussock *Poa labillardieri*, Black Gum *Eucalyptus aggregata* and tea–trees *Leptospermum spp.* near Queanbeyan and within the grassy groundlayer dominated by Kanagroo Grass under Box–Gum Woodland at Ilford (and Hall, ACT). Highly susceptible to grazing.	**0**	**Present** Box – Gum Woodland and Kangaroo Grass present within the proposal area.	**Unlikely** No records within the locality. proposal area was highly disturbed.	**No** Species unlikely to occur.

Caladenia concolor Crimson Spider Orchid	Habitat is regrowth woodland on granite ridge country that has retained a high diversity of plant species, including other orchids. The dominant trees are Blakely's Red Gum (*Eucalyptus blakelyi*), Red	**0**	**Present** Box-Gum woodland with	**Unlikely** Understorey of Box-gum	**No** Species unlikely to occur.

Species	Description of habitat[2]	No. of Records	Presence of habitat	Likelihood of occurrence	Possible impact?
BC - E	Stringybark (*E. macrorhyncha*), Red Box (*E. polyanthemos*) and White Box (*E. albens*); the diverse understorey includes Silver Wattle (*Acacia dealbata*), Hop Bitter-pea (*Daviesia latifolia*), Common Beard-heath (*Leucopogon virgatus*), Spreading Flax-lily (*Dianella revoluta*) and Poa Tussock (*Poa sieberiana*).		Blakely's Red Gum present within the proposal area.	woodland is highly exotic. No records within the locality.	
TECs					
White Box–Yellow Box–Blakely's Red Gum Grassy Woodland and Derived Native Grassland BC – CE EEC EPBC – CE EEC	Characterised by the presence or prior occurrence of White Box, Yellow Box and/or Blakely's Red Gum. The trees may occur as pure stands, mixtures of the three species or in mixtures with other trees, including wattles. Commonly co– occurring eucalypts include Apple Box (*E. bridgesiana*), Red Box (*E. polyanthemos*), Candlebark (*E. rubida*), Snow Gum (*E. pauciflora*), Argyle Apple (*E. cinerea*), Brittle Gum (*E. mannifera*), Red Stringybark (*E. macrorhyncha*), Grey Box (*E. microcarpa*), Cabbage Gum (*E. amplifolia*) and others. The understorey in intact sites is characterised by native grasses and a high diversity of herbs; the most commonly encountered include Kangaroo Grass (*Themeda australis*), Poa Tussock (*Poa sieberiana*), wallaby grasses (*Austrodanthonia spp.*), spear–grasses (*Austrostipa spp.*), Common Everlasting (*Chrysocephalum apiculatum),* Scrambled Eggs (*Goodenia pinnatifida*), Small St John's Wort (*Hypericum gramineum*), Narrow–leafed New Holland Daisy (*Vittadinia muelleri*) and blue–bells (*Wahlenbergia spp.).* Shrubs are generally sparse or absent, though they may be locally common.		**Present** Characteristic species present.	**Present** Qualified for assessment under the BC Act. Did not qualify for assessment under the EPBC Act.	**Yes** AoS completed
Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South- eastern Australia. EPBC – E	The Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia occurs in two forms. • The most common form is as grassy woodland comprising a tree layer and an understorey that must have native grasses but with a varying proportion of shrubs and herbs. • The derived native grassland form can occur in patches where the tree canopy and mid layer have been almost entirely removed but the native ground layer remains largely intact with high flora diversity.		**Not Present** Characteristic species not present.	**Unlikely** Not recorded within the proposal area.	**No** Not present in proposal area.

Species	Description of habitat[2]	No. of Records	Presence of habitat	Likelihood of occurrence	Possible impact?
E BC = listed as Endangered under Schedule 1 of the NSW *Biodiversity Conservation Act 2016* E EPBC = listed as Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.* V BC = listed as Vulnerable under Schedule 1 of the NSW *Biodiversity Conservation Act 2016.* V EPBC = listed as Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.* EEC BC = Endangered Ecological Community listed under Schedule 2 of the NSW *Biodiversity Conservation Act 2016* CE EPBC = listed as Critically Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.*					

C.2 Evaluation of the likelihood and extent of impact on threatened fauna species

Species	Description of Habitat	No. of Records	Presence of habitat	Likelihood of occurrence	Potential impact?
BIRDS					
Falco hypoleucos Grey Falcon BC - E	The Grey Falcon is sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. The breeding range has contracted since the 1950s with most breeding now confined to arid parts of the range. There are possibly less than 5000 individuals left. Population trends are unclear, though it is believed to be extinct in areas with more than 500mm rainfall in NSW. Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Also occurs near wetlands where surface water attracts prey. Preys primarily on birds, especially parrots and pigeons, using high-speed chases and stoops; reptiles and mammals are also taken.	0	**Present** A wooded watercourse is present within the proposal area.	**Unlikely** No records within the locality. Annual rainfall in region higher than 500 mm.	**No** Species widely distributed. No HBTs would be removed by the proposal.
Stagoopleura guttata Diamond Firetail BC - V	The Diamond Firetail is endemic to south-eastern Australia, extending from central Queensland to the Eyre Peninsula in South Australia. It is widely distributed in NSW. Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum *Eucalyptus pauciflora* Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities. Often found in riparian areas (rivers and creeks), and sometimes in lightly wooded farmland.	1	**Present** Habitat present.	**Possible** This species has a wide distribution. Is tolerant of disturbance.	**Yes** AoS completed
Polytelis swainsonii Superb Parrot BC – V, EPBC – V	The Superb Parrot is found throughout eastern inland NSW. On the South–western Slopes their core breeding area is roughly bounded by Cowra and Yass in the east, and Grenfell, Cootamundra and Coolac in the west. Birds breeding in this region are mainly absent during winter, when they migrate north to the region of the upper Namoi and Gwydir Rivers. Inhabits Box–Gum, Box–Cypress–pine and Boree Woodlands and River Red Gum Forest.	16	**Present** Box-Gum woodland is present in the proposal area.	**Present** The proposal area falls within this species known breeding range. Observed during field surveys.	**Yes** AoS completed
Grantiella picta	The Painted Honeyeater is nomadic and occurs at low densities	0	**Absent**	**Unlikely**	**No**

Species	Description of Habitat	No. of Records	Presence of habitat	Likelihood of occurrence	Potential impact?
Painted Honeyeater BC – V, EPBC – V	throughout its range. The greatest concentrations of the bird and almost all breeding occurs on the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland. Inhabits Boree, Brigalow and Box–Gum Woodlands and Box–Ironbark Forests. A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus *Amyema*. Insects and nectar from mistletoe or eucalypts are occasionally eaten. Nest from spring to autumn in a small, delicate nest hanging within the outer canopy of drooping eucalypts, she–oak, paperbark or mistletoe branches.		Characteristic tree species do not occur in the proposal area.	No records within the locality.	Species unlikely to occur.
Neophema pulchella Turquoise Parrot BC – V	Lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland. Usually seen in pairs or small, possibly family, groups and have also been reported in flocks of up to thirty individuals. Prefers to feed in the shade of a tree and spends most of the day on the ground searching for the seeds or grasses and herbaceous plants or browsing on vegetable matter. Forages quietly and may be quite tolerant of disturbance. However, if flushed it will fly to a nearby tree and then return to the ground to browse as soon as the danger has passed. Nests in tree hollows, logs or posts, from August to December. It lays four or five white, rounded eggs on a nest of decayed wood dust.	0	**Present** Eucalypt woodland present.	**Unlikely** No records within the locality. Groundcover within the proposal area was largely exotic.	**No** Species unlikely to occur.
Neophema chrysostoma Blue-winged Parrot BC – V, EPBC - V	The Blue-winged Parrot inhabits coastal, sub-coastal and inland areas, right through to semi-arid zones. Throughout their range, they favour grasslands and grassy woodlands. They are often found near wetlands both near the coast and in semi-arid zones. Blue-winged Parrots can also be seen in altered environments such as airfields, golf courses and paddocks.	0	**Absence** No semi-arid woodland or associated species found within the proposal area.	**Unlikely** No records within the locality.	**No** Species unlikely to occur.
Glossopsitta pusilla Little Lorikeet BC – V	NSW provides a large portion of the species' core habitat, with lorikeets found westward as far as Dubbo and Albury. Nomadic movements are common, influenced by season and food availability. Forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in Angophoras, Melaleucas and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. Isolated flowering trees in	0	**Present** Eucalyptus woodland present within the proposal area.	**Unlikely** No records within the locality.	**No** Species unlikely to occur – locally nomadic.

Species	Description of Habitat	No. of Records	Presence of habitat	Likelihood of occurrence	Potential impact?
	open country, e.g. paddocks, roadside remnants and urban trees also help sustain viable populations of the species. Feeds mostly on nectar and pollen, occasionally on native fruits such as mistletoe, and only rarely in orchards. Roosts in treetops, often distant from feeding areas. Nests in proximity to feeding areas if possible, most typically selecting hollows in the limb or trunk of smooth–barked Eucalypts. Entrance is small (3 cm) and usually high above the ground (2–15 m). These nest sites are often used repeatedly for decades, suggesting that preferred sites are limited. Riparian trees often chosen, including species like Allocasuarina. Nesting season extends from May to September.				
Artamus cyanopterus cyanopterus Dusky Woodswallow BC – V	The species primarily inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and groundcover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest. Also found in farmland, usually at the edges of forest or woodland. Most breeding activity occurs on the western slopes of the Great Dividing Range.	2	**Present** Woodland suitable to this species is present in the proposal area.	**Possible** The species has been recorded within the locality.	**Yes** AoS Completed.
Climacteris picumnus victoriae Brown Tree Creeper (Eastern Species) BC – V	Mainly inhabits woodlands dominated by stringybarks or other rough–barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (*Eucalyptus camaldulensis*). Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses.	8	**Present** Eucalypt woodland present within the proposal area.	**Likely** Records occur within the locality. The species is sedentary so likely still in the area.	**Yes** AoS completed.
Oxyura australis Blue-billed Duck BC – V	The Blue-billed Duck prefers deep water in large permanent wetlands and swamps with dense aquatic vegetation. The species is completely aquatic, swimming low in the water along the edge of dense cover. It will fly if disturbed but prefers to dive if approached.	0	**Absent** Deep water/dense aquatic vegetation does not occur within the proposal area.	**Unlikely** No records within the locality.	**No** Species unlikely to occur.

Transport
for NSW

Calidris acuminata Sharp-tailed Sandpiper	During the non-breeding season, approximately 91 percent of the East Asian - Australasian population occurs in Australia and New Zealand (Bamford et al. 2008). Sharp-tailed sandpipers occur within all states	0	**Absent** Freshwater and saline habitats	**Unlikely** No records within	**No** Species unlikely to occur.

Species	Description of Habitat	No. of Records	Presence of habitat	Likelihood of occurrence	Potential impact?
EPBC - V	of Australia. They are found mostly in the south-east and are widespread in both inland and coastal locations. The species also occurs in both freshwater and saline habitats (Cramp 1985; Higgins and Davies 1996). The species utilises fresh and hypersaline environments, feeding along the edge of water on mudflats, coastal and inland wetlands, and sewage ponds. After rainfall events, the species may also feed on areas of agricultural pasture (Higgins and Davies 1996; Weller et al. 2020).		do not occur within the proposal area.	the locality.	
MAMMALS					
Dasyurus maculatus maculatus (SE mainland population) Spotted-tailed Quoll BC – V, EPBC – E	This species is found in a range of forest habitats, from rainforest to open woodland. They require forest with suitable den sites such as rock crevices, caves, hollow logs, burrows and tree hollows. This species has a large home range and can cover considerate distances (more than 6km) overnight. It is largely nocturnal and solitary.	0	**Present** Open forest/woodland occurs at the site.	**Unlikely** No records within the locality.	**No** Species unlikely to occur. No HBTs would be removed by the proposed works.
Pteropus poliocephalus Grey–headed Flying–fox EPBC – V	Grey–headed Flying–foxes are found within 200 km of the eastern coast of Australia, from Bundaberg in Queensland to Melbourne in Victoria. Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source, often in stands of riparian rainforest, Paperbark or Casuarina forest, and are commonly found in gullies, close to water, or in vegetation with a dense canopy. Forage on the nectar and pollen of native trees, in particular *Eucalyptus*, *Melaleuca* and *Banksia,* and fruits of rainforest trees and vines. Travel up to 50 km to forage. Annual mating commences in January and a single young is born each October or November. Site fidelity to camps is high with some camps being used for over a century.	0	**Present** Water bodies occurred within the proposal area. Eucalypts were recorded.	**Unlikely** No records within the locality. The nearest known camp is located 27.3 km north east of the proposal area.	**No** Species unlikely to occur.
Phascolarctos cinereus Koala BC – V, EPBC – V	Occurs in eastern Australia, from north–eastern Queensland to south– eastern South Australia and to the west of the Great Dividing Range. In NSW it mainly occurs on the central and north coasts with some populations in the western region. It was historically abundant on the south coast of NSW, but now occurs in sparse and possibly disjunct populations. The koala inhabits a range of eucalypt forest and	0	**Present** Box-Gum Woodland occurs within the proposal area.	**Unlikely** This species has not been recorded within the locality.	**No** Species unlikely to occur.

Species	Description of Habitat	No. of Records	Presence of habitat	Likelihood of occurrence	Potential impact?
	woodland communities, including coastal forests, the woodlands of the tablelands and western slopes, and the riparian communities of the western plains.				
Nyctophilus corbeni Corben's Long-eared Bat BC – V, EPBC – V	Inhabits a variety of vegetation types, including Mallee, Bulloke *Allocasuarina leuhmanni* and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland. Roosts in tree hollows, crevices, and under loose bark.	0	**Present.** Box eucalypt dominated vegetation occurs within the proposal area.	**Possible.** Species has a wide distribution. No records within the locality.	**No** Species unlikely to occur. No HBTs would be removed by the proposed work.
AMPHIBIANS					
Litoria raniformis Growling Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog BC – E, EPBC – V	Currently, the species is known to exist only in isolated populations in the Coleambally Irrigation Area, the Lowbidgee floodplain and around Lake Victoria. Usually found in or around permanent or ephemeral Black Box/Lignum/Nitre Goosefoot swamps, Lignum/Typha swamps and River Red Gum swamps or billabongs along floodplains and river valleys. They are also found in irrigated rice crops, particularly where there is no available natural habitat. Breeding occurs during the warmer months and is triggered by flooding or a significant rise in water levels. During the breeding season animals are found floating amongst aquatic vegetation (especially cumbungi or Common Reeds). Tadpoles require standing water for at least 4 months for development and metamorphosis to occur but can take up to 12 months to develop. Outside the breeding season animals disperse away from the water and take shelter beneath ground debris such as fallen timber and bark, rocks, grass clumps and in deep soil cracks.	0	**Present** Aquatic habitat occurred within the proposal area.	**Unlikely** This species has a restricted distribution.	**No** Species unlikely to occur.
Crinia sloanei Sloane's Froglet BC – V, EPBC – E	This species is typically associated with periodically inundated areas in grassland, woodland and disturbed habitats. Live along permanent streams with some fringing vegetation cover such as ferns, sedges or grasses. Adults occur on or near cobble banks and other rock structures within stream margins. Shelter under rocks or amongst vegetation near the ground on the stream edge. Sometimes bask in the sun on exposed rocks near flowing water during summer.	0	**Present** Suitable aquatic habitat occurs within the proposal area.	**Unlikely** This species has a limited distribution, occurring within the Murray River.	**No** Species unlikely to occur.
REPTILES					

Species	Description of Habitat	No. of Records	Presence of habitat	Likelihood of occurrence	Potential impact?
Aprasia parapulchella Pink–tailed Worm– lizard, Pink–tailed Legless Lizard BC – V, EPBC – V	Inhabits sloping, open woodland areas with predominantly native grassy ground layers, particularly those dominated by Kangaroo Grass (*Themeda australis*). Sites are typically well–drained, with rocky outcrops or scattered, partially buried rocks. Commonly found beneath small, partially embedded rocks and appear to spend considerable time in burrows below these rocks; the burrows have been constructed by and are often still inhabited by small black ants and termites. Feeds on the larvae and eggs of the ants with which it shares its burrows.	0	**Present** Rocky habitat/ Kangaroo Grass occurs within the proposal area.	**Unlikely** No records within the locality. Ground layer was dominated by exotic vegetation.	**No** Species unlikely to occur.
Delma impar Striped Legless Lizard BC – V, EPBC - V	Found mainly in Natural Temperate Grassland but has also been captured in grasslands that have a high exotic component. Also found in secondary grassland near Natural Temperate Grassland and occasionally in open Box-Gum Woodland. Habitat is where grassland is dominated by perennial, tussock-forming grasses such as Kangaroo Grass *Themeda australis,* spear- grasses *Austrostipa spp.* and poa tussocks *Poa spp.,* and occasionally wallaby grasses *Austrodanthonia spp.* Sometimes present in modified grasslands with a significant content of exotic grasses. Sometimes found in grasslands with significant amounts of surface rocks, which are used for shelter.	0	**Present** Exotic dominated grassland, with some native species, occurs within the proposal area.	**Unlikely** No records within the locality. Populations are only known in the Goulburn, Queanbeyan, Cooma, Yass, Muswellbrook and Tumut areas.	**No** Species unlikely to occur.
FISH					
Macquaria australasica Macquarie Perch EPBC – E	Macquarie perch grow to a maximum size of 400mm. They are found in the Murray–Darling Basin (particularly upstream reaches) of the Lachlan, Murrumbidgee and Murray rivers, and parts of south– eastern coastal NSW, including the Hawkesbury and Shoalhaven catchments. Macquarie perch are found in both river and lake habitats, especially the upper reaches of rivers and their tributaries. They are quiet, furtive fish that feed on aquatic insects, crustaceans and molluscs. Sexual maturity occurs at two years for males and three years for females. Macquarie perch spawn in spring or summer in shallow upland streams or flowing parts of rivers. Females produce around 50,000–100,000 eggs which settle among stones and gravel of the stream or river bed.	0	**Absent** Aquatic habitat within the proposal is unsuitable.	**Unlikely** No records within the locality.	**No** Species unlikely to occur.
Maccullochella peelii Murray Cod	Murray cod are able to live in a wide range of habitats from clear, rocky streams in the upper western slopes regions of New South	0	**Absent**	**Unlikely** No records within	**No**

Species	Description of Habitat	No. of Records	Presence of habitat	Likelihood of occurrence	Potential impact?
EPBC – V	Wales to the slow flowing, turbid rivers and billabongs of the western plains. Generally, they are found in waters up to 5m deep and in sheltered areas with cover from rocks, timber or overhanging banks. The most common components of adult cod's diet include crustaceans such as yabbies, shrimp and crayfish, and fish such as the introduced common carp, goldfish and redfin perch, and the native fishes bony herring, catfish, golden perch, western carp gudgeon and even other cod. It appears that Murray cod prefer protected spawning sites, and typically spawn large (3.0–3.5mm diameter) adhesive eggs onto firm substrates such as hollow logs, rocks, pipes and clay banks, from spring to early summer.		Aquatic habitat within the proposal is unsuitable.	the locality.	Species unlikely to occur.
Maccullochella macquariensis Trout Cod EPBC – V	Trout Cod habitat is not well understood, but they appear to favour deep, fast flowing waters. Cover is vital, and they are often found sheltering under snags (woody debris).	0	**Absent** Aquatic habitat within the proposal is unsuitable.	**Unlikely** No records within the locality.	**No** Species unlikely to occur.
INVERTEBRATES					
Synemon plana Golden Sun Moth BC – E EPBC – CE	Known populations are found between Queanbeyan, Gunning, Young and Tumut. Species distribution extended from Bathurst through to the NSW Southern Tablelands and central and western Victoria though to eastern South Australia. Occurs within Natural Temperate Grasslands and grassy box–gum Woodlands in which ground layer is dominated by wallaby grasses. Grasslands dominated by wallaby grass are typically low and open, bare ground between grass tussocks is thought to be an important microhabitat feature for this species. This area is where females are typically observed displaying to attract males. Known habitat may contain several wallaby grass species, typically associate with spear grasses or Kangaroo Grass. Adults are short lived (one to four days) and do not feed, having no mouthparts, the larvae are thought to feed exclusively on the roots of wallaby grasses. Eggs are laid at the base of wallaby grasses. Males will not fly more than 100m from suitable habitat. Populations separated more than 200m can be considered isolated populations that have gone extinct and are highly unlikely to be recolonised.	0	**Present** Woodland and associated grass species are present within the proposal area.	**Unlikely** No records within the locality. Groundlayer species are highly exotic. The proposal area is outside of the known populations for this species.	**No** Species unlikely to occur.

Species	Description of Habitat	No. of Records	Presence of habitat	Likelihood of occurrence	Potential impact?
Keyacris scurra *Key's Matchstick Grasshopper* BC – E, EPBC - E					
MIGRATORY					
Calidris ferruginea Curlew Sandpiper BC – E, EPBC – CE, M	It generally occupies littoral and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats of sheltered coasts. It also occurs in non-tidal swamps, lakes and lagoons on the coast and sometimes inland. It forages in or at the edge of shallow water, occasionally on exposed algal mats or waterweed, or on banks of beach-cast seagrass or seaweed.	0	**Absent** Coastal habitat does not occur within or nearby to the proposal area.	**Unlikely** No records within the locality.	**No** Species unlikely to occur.
Hirundapus caudacutus White–throated Needletail EPBC – V, M	Most White–throated Needletails spend the non–breeding season in Australasia, mainly in Australia, and occasionally in New Guinea and New Zealand. In Australia, the White–throated Needletail is almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground. Although they occur over most types of habitat, they are probably recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland. They also commonly occur over heathland but less often over treeless areas, such as grassland or swamps.	0	**Present** Woodland present in study area.	**Unlikely** No records within the locality. Species almost exclusively aerial.	**No** Species unlikely to occur/be impacted.
Apus pacificus Fork-tailed Swift EPBC - M	Preferred habitat includes mountains, near water. This species breeds in the north-east and mid-east Asia and winters in Australia and southern New Guinea. It is a visitor to most parts of Western Australia, beginning to arrive in the Kimberley in late September, in the Pilbara and Eucla in November and in the south-west land division in mid-December, and leaving by late April. They never settle voluntarily on the ground and spend most of their lives in the air, living on the insects they catch in their beaks.	0	**Absent** No mountainous terrain present in the proposal area.	**Unlikely** No records within the locality.	**No** This species is almost exclusively aerial. Would not be impacted.

Transport for NSW

Motacilla flava Yellow Wagtail	Widespread wagtail, favouring wet meadows, marshland, grassy and muddy lakeshores.	0	**Present** Wetland habitat	**Unlikely** No records within	**No**

Species	Description of Habitat	No. of Records	Presence of habitat	Likelihood of occurrence	Potential impact?
EPBC - M			occurs within the proposal area.	the locality. Wetland habitat was small in size and unlikely to support this species.	Species unlikely to occur.
Actitis hypoleucos Common Sandpiper BC -E, EPBC – CE, M	In Australia, the Common Sandpiper is found in coastal or inland wetlands, both saline or fresh. It is found mainly on muddy edges or rocky shores.	0	**Present** Wetlands occur in the proposal area.	**Unlikely** No records within the locality. Wetland habitat was small in size and unlikely to support this species.	**No** Species unlikely to occur.
Calidris acuminata Sharp-tailed Sandpiper EPBC – M	This species prefers non-tidal wetlands, especially freshly exposed mudflats in drying lakes and on intertidal mudflats.	0	**Present** Wetlands occur in the proposal area.	**Unlikely** No records within the locality. Wetland habitat was small in size and unlikely to support this species.	**No** Species unlikely to occur.
Calidris melanotos Pectoral Sandpiper EPBC – M	A small number of these birds are known to reach Australia and are believed to be concentrated in south-eastern Australia. This species prefers freshwater mudflats.	0	**Absent** No freshwater mudflats occur within the proposal area.	**Unlikely** No records within the locality.	**No** Species unlikely to occur.
Gallinago hardwickii Latham's Snipe EPBC – M	This species usually inhabits open, freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies). However, they can also occur in habitats with saline or brackish water, in modified or artificial habitats, and in habitats located close to humans or human activity.	0	**Present** Wetlands occur in the proposal area.	**Unlikely** No records within the locality. Wetland habitat was small in size and unlikely to support this species.	**No** Species unlikely to occur.
MARINE					

Species	Description of Habitat	No. of Records	Presence of habitat	Likelihood of occurrence	Potential impact?
Ardea ibis Cattle Egret EPBC – Mar.	The Cattle Egret is found in grasslands, woodlands and wetlands, and is not common in arid areas. It also uses pastures and croplands, especially where drainage is poor.	0	**Present** Woodlands occur within the proposal area.	**Unlikely** No records within the locality. The proposal area is highly disturbed.	**No** Species unlikely to occur.
Chrysococcyx osculans Black-eared Cuckoo EPBC – Mar.	The Black-eared Cuckoo is found in drier country where species such as mulga and mallee form open woodlands and shrublands. It is often found in vegetation along creek beds.	0	**Present** Open woodland occurs within the proposal area.	**Unlikely** No records within the locality.	**No** Species unlikely to occur.
Merops ornatus Rainbow bee-eater EPBC – Mar.	The Rainbow Bee-eater is most often found in open forests, woodlands and shrublands, and cleared areas, usually near water. It will be found on farmland with remnant vegetation and in orchards and vineyards. It will use disturbed sites such as quarries, cuttings and mines to build its nesting tunnels.	0	**Absent** Open forest occurs within the proposal area; no breeding habitat was observed.	**Unlikely** No records within the locality.	**No** Species unlikely to occur.

CE BC = listed as Critically Endangered under Schedule 1 of the NSW *Biodiversity Conservation Act 2016*
CE EPBC = listed as Critically Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.*
E BC = listed as Endangered under Schedule 1 of the NSW *Biodiversity Conservation Act 2016*
E EPBC = listed as Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.*
V BC = listed as Vulnerable under Schedule 1 of the NSW *Biodiversity Conservation Act 2016*
V EPBC = listed as Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.* M EPBC = listed as Migratory under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.* Mar. EPBC = listed as Marine under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.* CAMBA = Chinese–Australia Migratory Bird Agreement
JAMBA = Japan-Australia Migratory Bird Agreement

Appendix D BC Act Assessments of Significance

Part 7.3 of the *Biodiversity Conservation Act 2016* (BC Act) specifies five factors to be taken into account when deciding whether a development is likely to significantly affect threatened species, populations or ecological communities, or their habitats, listed at the state level under the *Biodiversity Conservation Act 2016*.

This *Five-part Test* characterises the significance of likely impacts associated with the proposal on the following species and ecological communities:

- Groundcover species:
  - *Cullen parvum* Small Scurf-pea BC – E
  - *Swainsona recta* Small Purple–pea BC – E
- EEC:
  - *White Box–Yellow Box–Blakely's Red Gum Grassy Woodland and Derived Native Grassland*, BC – CE
- Ground foraging birds:
  - *Stagonopleura guttata* Diamond Firetail BC - V
  - *Polytelis swainsonii* Superb Parrot BC – V
  - *Artamus cyanopterus cyanopterus* Dusky Woodswallow BC – V
  - *Climacteris picumnus victoriae* Brown Tree Creeper (Eastern Species) BC – V

a) In the case of a threatened species, whether the proposed development is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.
Groundcover species: Small Scurf-pea and Small Purple-pea.
The Small Scurf-pea and Small Purple-pea were not detected during the site survey. However, due to seasonal conditions they may have been overlooked. Habitat within the proposal area showed evidence of prior disturbance. The Small Scurf-pea has shown a preference for disturbed habitats, while the Small Purple-pea is known to grow along railway easements (OEH, 2012). Therefore, suitable habitat for these species occurs within the proposal area. The proposal would result in the disturbance and removal of up to 0.61 ha of largely exotic PCT 277 vegetation from within the proposal area. Groundcover disturbance within the proposal area would occur either side of the bridge and within the proposed road formation. Vegetation to be removed represents approximately 0.01% of PCT 277 habitat within the greater locality. HBTs would be retained during the works, preserving connectivity with surrounding woodland habitat. Any potential occurrence of a seed bank for these species would not be removed by the proposed works. The area of vegetation to be removed by the works is small given the local context. Given the pre-disturbed nature of the site, an adverse impact is considered unlikely to occur. The proposal is not considered an action that would have an adverse effect on the life cycle of these species, nor is it considered an action that would place a local viable population at risk of extinction.
Ground Foraging Birds:, Diamond Firetail, Superb Parrot, Dusky Woodswallow, Brown Tree Creeper.
A Superb Parrot (*Polytelis swainsonii*) was observed flying overhead during the site survey. No other threatened species were observed during the site survey. However, due to the size of the proposal area and seasonal conditions they may not have been present at the time. Suitable habitat for the listed species occurs within the proposal area. Habitat within the proposal area showed evidence of prior disturbance, which likely accounted for the high proportion of exotic species within the proposal area. The proposal would result in the disturbance and removal of up to 0.61 ha

a) In the case of a threatened species, whether the proposed development is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.
of foraging habitat potentially suitable for these species. Woodland disturbance within the proposal area would occur on either side of the bridge and within the proposed road formation. Vegetation to be removed represents approximately 0.01% of PCT 277 habitat within the greater locality. There are no HBTs proposed to be impacted during the works. The area of vegetation to be removed by the works is small given the local context. Given the pre-disturbed nature of the site, an adverse impact is considered unlikely to occur. The proposal is not considered an action that would have an adverse effect on the life cycle of these species, nor is it considered an action that would place a local viable population at risk of extinction.
a) In the case of an endangered ecological community, or critically endangered ecological community, whether the proposed development or activity: a. Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction. b. Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.
Groundcover species
Not applicable.
CEEC: White Box–Yellow Box–Blakely's Red Gum Grassy Woodland and Derived Native Grassland
a) The works would directly impact up to 0.61 ha of White Box-Yellow Box Woodland critically endangered ecological community (CEEC). Impacts to this CEEC would occur as small patches on either side of the existing road formation. These patches are relatively small in the local context, representing only 0.01% of PCT 277 vegetation within the locality. The proposed works are not likely to have an adverse effect on the extent of this CEEC such that its local occurrence is likely to be placed at risk of extinction. b) The proposed works would remove approximately 0.61 ha of this CEEC. Impacts to woodland vegetation would occur as narrow linear strips along either side of the bridge and the existing road formation. The proposal area showed evidence of prior disturbance, which accounts for the high number of exotic species that were observed during the site survey. It is considered unlikely that the proposal would substantially and adversely modify the composition of the ecological community such that its local occurrence would be placed at risk of extinction.
Ground foraging birds
Not applicable.
b) In relation to the habitat of a threatened species or ecological community: i. The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and ii. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and iii. The importance of the habitat to be removed, modified, fragmented or isolated to the long–term survival of the species or ecological community in the locality.
Groundcover species
i. Up to 0.61 ha of woodland vegetation suitable to these species would incur impacts from the proposal.

a) In the case of a threatened species, whether the proposed development is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.
Groundcover disturbance would occur as strips on either side of the bridge and within the proposed road formation. Understory vegetation to be removed is highly exotic in nature and representative of approximately 0.01% of PCT 277 woodland habitat within the greater locality. ii. No further fragmentation or isolation is expected as a result of the proposed works. The area to be impacted occurs within a heavily cleared landscape. No HBTs would be removed by the proposed works. Impacted vegetation represents a small portion of woodland habitat within the surrounding area. No further fragmentation or isolation is expected as a result of the proposed development. iii. The area of habitat to be disturbed/removed is small (0.01%) given the local context. This habitat is not likely to be important for these species, given the previous disturbance associated with the road corridor, agricultural activities and edge effects.
CEEC: White Box–Yellow Box–Blakely's Red Gum Grassy Woodland and Derived Native Grassland
i. Up to 0.61 ha of this CEEC would incur impacts from the proposal. Disturbance to this CEEC would occur as isolated patches on either side of the existing road formation. Vegetation to be removed is highly exotic in nature and represents approximately 0.01% of PCT 277 woodland habitat within the greater locality. ii. No further fragmentation or isolation is expected as a result of the proposed works. The area to be impacted occurs within a heavily cleared landscape. No HBTs would be removed by the proposed works. Impacted vegetation represents a small portion of woodland habitat within the surrounding area. No further fragmentation or isolation is expected as a result of the proposed development. iii. The area of habitat to be disturbed/removed is small (0.01%) given the local context. This habitat is not likely to be important for this CEEC, given the previous disturbance associated with the road corridor, agricultural activities and edge effects.
Ground Foraging Birds
i. Up to 0.61 ha of woodland vegetation suitable to these species would incur impacts from the proposal. Groundcover disturbance would occur as strips on either side of the bridge and within the proposed road formation. Vegetation to be removed is highly exotic in nature and representative of approximately 0.01% of PCT 277 woodland habitat within the greater locality. ii. No further fragmentation or isolation is expected as a result of the proposed works. The area to be impacted occurs within a heavily cleared landscape. No HBTs would be removed by the proposed works. Impacted vegetation represents a small portion of woodland habitat within the surrounding area. No further fragmentation or isolation is expected as a result of the proposed development. iii. The area of habitat to be disturbed/removed is small (0.01%) given the local context. This habitat is not likely to be important for these species, given the previous disturbance associated with the road corridor, agricultural activities and edge effects.
c) Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).
No Areas of Outstanding Biodiversity Values (AOBV) occur within or adjacent to the proposal area.
d) Whether the proposed development or activity is part of a key threatening process or is likely to increase the impact of a key threatening process.
The BC Act lists numerous key threatening processes (KTP's). KTP's relevant to the proposal including the following: • Clearing of native vegetation. • Invasion of native plant communities by exotic perennial grasses.

a)	In the case of a threatened species, whether the proposed development is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

- Invasion and establishment of exotic vines and scramblers
- Aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Minors *Manorina melanocephala*

Clearing of native vegetation

Clearing of native vegetation is recognised as a major factor contributing to loss of biological diversity. In the determination, the NSW Scientific Committee found that 'clearing of any area of native vegetation, including areas less than two hectares in extent, may have significant impacts on biological diversity." The proposed works would remove approximately 0.61 ha of woodland vegetation from within the proposal area. Evidence of prior disturbance, in the form of clearing and subsequent regeneration, already exists within the proposal area.

Vegetation trimming and removal would occur as parallel linear strips on either side of the trail. Vegetation to removed is largely regenerative. No HBTs or remnant woodland would be impacted by the proposed works. It is considered that, with the appropriate mitigation measures in place, the proposal would result in a minor increase of this KTP.

Invasion of native plant communities by exotic perennial grasses

Exotic perennial grasses invade native plant communities, competing with, and displacing, many native species. Dense monocultures of perennial grasses that develop after invasion threaten local vegetation at all sites that are affected.
This may result in local and regional declines of many native species and communities, possibly to the extent that they become endangered.

The proposal involves disturbance that can lead to the establishment of exotic perennial grasses. As part of the mitigation measures, it has been recommended that construction machinery would be cleaned prior to entering and exiting work sites, and regular targeted control of priority weeds would be undertaken to reduce the risk of weeds being introduced and spread. With the implementation of these measures, the proposal would be unlikely to increase the impact of this KTP.

Invasion and establishment of exotic vines and scramblers

A large number of exotic vines and scramblers have become established in New South Wales, which have significant adverse impacts on biodiversity. They can smother native vegetation and seedlings, and prevent recruitment, especially in riparian areas.

The proposal involves disturbance that can lead to the establishment of exotic vines and scramblers. As part of the mitigation measures, it has been recommended that construction machinery would be cleaned prior to entering and exiting work sites. With the implementation of these measures, the proposal would be unlikely to increase the impact of this KTP.

Aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Minors *Manorina melanocephala*

The proposal area has a history of disturbance and experiences edge effects as a result of the existing road. It is considered that the proposal would not further fragment the existing environment or increase edge effects. The Noisy Miner is already present in the proposal area and it is unlikely the proposal would contribute to the Noisy Miners growth.

Conclusion

The impacts of the proposal on the assessed threatened species listed under the BC Act are manageable. A significant impact is considered unlikely, based on the following conclusions:

- The amount of habitat to be removed or disturbed by the proposal is relatively small within in the local context. No HBTs would be impacted by the proposal.
- Minimal fragmentation or isolation of habitat would occur.
- Mitigation measures have been recommended to further reduce impacts to biodiversity.

- No substantial contribution to any Key Threatening Process are expected, if mitigation measures are followed.

Appendix E EPBC Act Test of Significance

E.1 Vulnerable Species

The *Environment Protection and Biodiversity Conservation Act 1999* specifies factors to be taken into account in deciding whether a development is likely to significantly affect Endangered Ecological Communities, threatened species and migratory species, listed at the Commonwealth level. These assessments characterise the significance of likely impacts associated with the proposal on the following Vulnerable species:

- *Polytelis swainsonii* Superb; EPBC - V

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:
a) Will the action lead to a long-term decrease in the size of an important population of a species?
Superb Parrot
Two Superb Parrots were observed flying over the proposal area. The National Recovery Plan for the Superb Parrot (Baker-Gabb, 2011) indicates that this species shows a preference for nesting on major waterways. The proposal area is located approximately 63 km north of the Murrumbidgee River, a known breeding location for this species. This species is known to nest within 25 km of major waterways and, as such, the proposal area is not considered to be an important breeding area for this species. Around 0.61 ha of woodland habitat, potentially suitable for these species would be removed by the proposed works. No HBTs would be removed by the proposed work. The vegetation proposed for removal does not form part of any important or large wildlife movement corridor. As the population does not occur within; a core breeding area, an area that maintains genetic diversity or an area near the limit of the species range, an important population of Superb Parrot is not considered to occur within the proposal area. The proposal is not considered an action that would lead to a long-term decrease in the size of an important population of this species. Due to the potential presence of hollow-bearing species it has been recommended that that a suitably qualified person is present to survey woodland vegetation for removal prior to the commencement of works to rescue and/or relocate any fauna, including breeding fauna. An unexpected threatened species find procedure would be implemented.
b) Will the action reduce the area of occupancy of an important population of a species?
Superb Parrot
As noted above, this species has been recorded within the locality; however, no important population is known to occur within the proposal area. Approximately 0.61 ha of woodland suitable to this species would be removed for the proposal, representing 0.01% of PCT 277 woodland within the locality. This vegetation is unlikely to be important to the survival of this species. Therefore, the proposal is not considered an action that would reduce the area of occupancy of any important population for this species.
c) Will the action fragment an existing important population into two or more populations?
Superb Parrot
As noted above, an important population is not likely to occur within the proposal area, The vegetation proposed for removal does not form part of any important or large wildlife movement corridor. Removal of woodland vegetation within the proposal area would occur as isolated patches on either side of the road formation. Therefore, the proposal is not considered an action that would fragment an important population of this species into two or more populations.
d) Will the action adversely affect habitat critical to the survival of a species?
Superb Parrot
The National Recovery Plan for the Superb Parrot, states habitat critical to the survival of the Superb Parrot can be divided into breeding and foraging habitat. Breeding is unlikely to occur within the Wallendbeen area. The proposal would result in the disturbance/removal of up to 0.61 ha of potential foraging habitat from within the proposal area. This species is known to roam widely in search of food. The removal of 0.61 ha of PCT 277 habitat represents approximately 0.01% of PCT 277 habitat within the locality. Therefore, the proposal is not considered an action that would adversely affect the survival of this species.

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:
e) Will the action disrupt the breeding cycle of an important population?
Superb Parrot
The proposal has the potential to disrupt and impact the lifecycle of any birds nesting in HBTs. Wallendbeen is not an important breeding location for this species, due to its distance from major rivers. Furthermore, no HBTs would be impacted by the proposed works. Therefore, the works are not considered likely to disrupt the breeding cycle of an important population of this species.
f) Will the action modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?
Superb Parrot
The proposal would result in the removal of up to 0.61 ha of potential foraging habitat from within the proposal area. No HBTs would be removed by the proposed works. Vegetation removal would occur as strips on either side of the bridge and within the proposed road formation. This woodland already experiences edge effects, associated with the existing road corridor. The proposal area does not represent an important breeding location for this species. Therefore, the proposal is not considered an action that would modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
g) Will the action result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat?
Invasive flora species, including Blackberry (*Rubus spp.*), have been recorded in the proposal area. The proposal has the potential to contribute to the spread of invasive species, mainly through the clearing of vegetation and transfer and introduction of plant material and soil on machinery. Mitigation measures have been recommended to prevent the spread of weeds on site. The proposal would therefore be unlikely to result in invasive species that are harmful to these species becoming established in their potential habitat.
h) Will the action introduce disease that may cause the species to decline?
The proposal has the potential to contribute to the spread of disease through the transfer and introduction of plant material and soil on machinery. Mitigation measures have been recommended to prevent the spread of disease on site. The proposal would therefore be unlikely to result in disease which may cause the species to decline.
i) Will the action interfere substantially with the recovery of the species?
Superb Parrot
The National Recovery Plan for Superb Parrot lists the following specific objectives: • Determine population trends in the Superb Parrot. • Increase the level of knowledge of the Superb Parrot's ecological requirements. • Develop and implement threat abatement strategies. • Increase community involvement in and awareness of the Superb Parrot recovery program. The proposal would not interfere with any of these objectives.

Conclusion

The impacts of the proposal on the assessed threatened species listed under the EPBC Act are considered to be manageable. A significant threat is considered unlikely based on the following conclusions:

- The amount of habitat to be removed or disturbed by the proposal is relatively small in the local context.
- Minimal fragmentation of the habitat would occur.
- No HBTs would be removed by the proposed works.
- No substantial contribution to any key threatening process would be expected.
- No impact to any important population is expected by the proposed works.
- Mitigation measures have been recommended to minimise potential impacts to threatened species.

E.2 Endangered Species

The *Environment Protection and Biodiversity Conservation Act 1999* specifies factors to be taken into account in deciding whether a development is likely to significantly affect Endangered Ecological Communities, threatened species and migratory species, listed at the Commonwealth level. These assessments characterise the significance of likely impacts associated with the proposal on the following Endangered and Critically Endangered species:

- Groundcover species:
  - *Swainsona recta* Small Purple–pea EPBC– E

An action is likely to have a significant impact on an Endangered or Critically Endangered species if there is a real chance or possibility that it will:
a) lead to a long-term decrease in the size of a population
Small Purple-pea
No known population of Small-purple pea occurs within the proposal area; however, potential habitat for the Small Purple- pea occurs within the proposal area as grassy woodlands. This species was not observed within the proposal area during the site survey. However, this species is inconspicuous and may not have been detected during the survey period. The proposal has the potential to disrupt the lifecycle of any potential occurrence of this species through ground disturbance and potential removal of existing plants. The proposal would disturb up to 0.61 ha of habitat potentially suitable for this species. Disturbance would be staggered as vehicles and equipment works move from one end of the proposal area to the other. Groundcover disturbance within the proposal area would occur as parallel linear strips on either side of the bridge and within the proposed road corridor. The proposal area has already been largely disturbed and, as such, vegetation removed would be largely exotic in nature. Better condition vegetation surrounding the HBTS would not be removed by the proposal and . any potential occurrence of a seed bank for these species here would not be impacted by the proposed works. Given the short-term nature of the disturbance, the pre-disturbed condition of the proposal area and providing that appropriate mitigation measures are adhered to, the proposal is not considered an action that would lead to a long-term decrease in any potential population of this species. An unexpected threatened species find procedure would be implemented.
b) reduce the area of occupancy of the species
Small Purple-pea
The proposal would result in the removal of up to 0.61 ha of habitat potentially suitable for this species. Groundcover disturbance within the proposal area would occur as parallel linear strips on either side of the bridge and within the proposed road corridor. The proposal area has already been largely disturbed and, as such, vegetation removed would be largely exotic in nature. HBTs would be avoided during the works, providing refuges for this species. Any potential occurrence of a seed bank for these species would not be impacted by the proposed works. Given the short-term nature of the disturbance, the pre-disturbed condition of the proposal area and providing that appropriate mitigation measures are adhered to, the proposal is not considered an action that would reduce the area of occupancy of this species.
c) Will the action fragment an existing population into two or more populations?
Small Purple-pea
As stated above, groundcover disturbance within the proposal area would occur as parallel linear strips on either side of the bridge and within the proposed road corridor. The proposal area has already been largely disturbed and, as such, vegetation

An action is likely to have a significant impact on an Endangered or Critically Endangered species if there is a real chance or possibility that it will:
removed would be largely regenerative in nature. HBTs would be avoided during the works, providing refuges for this species. Any potential occurrence of a seed bank for these species would not be impacted by the proposed works. Given the short-term nature of the disturbance, the pre-disturbed condition of the proposal area and providing that appropriate mitigation measures are adhered to, the proposal is not considered an action that would fragment an existing population into two or more populations.
d) Will the action adversely affect habitat critical to the survival of a species?
Small Purple-pea
According to the National Recovery Plan for the Small Purple-pea (OEH, 2012), all populations of the Small Purple-pea and the habitat they occupy are critical to the survival of this species. No priority management sites for this species occur within or nearby to the proposal area. The proposal would result in a short-term decrease in habitat suitable for this species. HBTs would be avoided during the works, providing refuges for this species. Any potential occurrence of a seed bank for these species would not be impacted by the proposed works. The action is unlikely to affect habitat critical to the survival of this species.
e) Will the action disrupt the breeding cycle of a population?
Small Purple-pea
The species is known to flower in Spring, with peaks in October. The proposal has the potential to disrupt the lifecycle of any potential occurrence of these species through ground disturbance and potential removal of existing plants. The proposal would result in a short-term decrease in habitat suitable for this species. HBTs would be avoided during the works, providing refuges for this species. Any potential occurrence of a seed bank for these species would not be impacted by the proposed works. This species is a disturbance specialist. Therefore, the proposal is not considered an action that would disrupt the breeding cycle of this species.
f) Will the action modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?
Small Purple-pea
The proposal would result in a short-term decrease in habitat suitable for this species. Remnant vegetation would be avoided during the works, providing refuges for this species. Any potential occurrence of a seed bank for these species would not be impacted by the proposed works. The proposal is not considered an action that would modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
g) Will the action result in invasive species that are harmful to a Critically Endangered or Endangered species becoming established in the Critically Endangered or Endangered species' habitat?
Invasive flora species, including Blackberry (*Rubus spp.*) have been recorded in the proposal area. The proposal has the potential to contribute to the spread of invasive species, mainly through the clearing of vegetation and transfer and introduction of plant material and soil on machinery. Mitigation measures have been recommended to prevent the spread of weeds on site. The proposal would therefore be unlikely to result in invasive species that are harmful to these species becoming established in their potential habitat.
h) Will the action introduce disease that may cause the species to decline?
The proposal has the potential to contribute to the spread of disease through the transfer and introduction of plant material and soil on machinery. Mitigation measures have been recommended to prevent the spread of disease on site. The proposal

An action is likely to have a significant impact on an Endangered or Critically Endangered species if there is a real chance or possibility that it will:
would therefore be unlikely to result in disease which may cause the species to decline.
i) Will the action interfere substantially with the recovery of the species?
Small Purple-pea
The National Recovery Plan for the Small Purple-pea (OEH, 2012) details the following recovery objectives: • All natural populations are stable or increasing. • Maintain current genetic diversity across the range of the species. • Achieve formal protection for currently unprotected populations. The proposal would not interfere with these objectives.

Conclusion

The impacts of the proposal on the assessed threatened species listed under the BC Act are manageable. A significant impact is considered unlikely, based on the following conclusions:

- The amount of habitat to be removed or disturbed by the proposal is relatively small within in the local context. No HBTs would be impacted by the proposal.
- Minimal fragmentation or isolation of habitat would occur. As mentioned in REF the clearing is on the edge of woodland habitats, so no future fragmentation or isolation of habitat would occur.
- Mitigation measures have been recommended to further reduce impacts to biodiversity.

Appendix F Statutory consultation checklists

F.1 Matters of National Environmental Significance and Commonwealth land

Certain development types

Development type	Description	Yes / No	If 'yes' consult with	SEPP (Transport and Infrastructure) section
Car park	Does the project include a car park intended for the use by commuters using regular bus services?	No		Section 2.110
Bus depots	Does the project propose a bus depot?	No		Section 2.110
Permanent road maintenance depot and associated infrastructure	Does the project propose a permanent road maintenance depot or associated infrastructure such as garages, sheds, tool houses, storage yards, training facilities and workers' amenities?	No		Section 2.110

Development within the Coastal Zone

Issue	Description	Yes / No / N/A	If 'yes' consult with	SEPP (Transport and Infrastructure) section
Development with impacts on certain land within the coastal zone	Is the proposal within a coastal vulnerability area and is inconsistent with a certified coastal management program applying to that land?	No		Section 2.14

Note: See interactive map Coastal management - (nsw.gov.au). Note the coastal vulnerability area has not yet been mapped.

Note: a certified coastal zone management plan is taken to be a certified coastal management program.

Council related infrastructure or services

Development type	Potential impact	Yes / No	If 'yes' consult with the relevant local council(s).	SEPP (Transport and Infrastructure) section
Stormwater	Are the works likely to have a substantial impact on the stormwater management services which are provided by council?	No		Section 2.10
Traffic	Are the works likely to generate traffic to an extent that will strain the capacity of the existing road system in a local government area?	No		Section 2.10
Sewerage system	Will the works involve connection to a council owned sewerage system? If so, will this connection have a substantial impact on the capacity of any part of the system?	No		Section 2.10
Water usage	Will the works involve connection to a council owned water supply system? If so, will this require the use of a substantial volume of water?	No		Section 2.10
Temporary structures	Will the works involve the installation of a temporary structure on, or the enclosing of, a public place which is under local council management or control? If so, will this cause more than a minor or inconsequential disruption to pedestrian or vehicular flow?	No		Section 2.10
Road and footpath excavation	Will the works involve more than minor or inconsequential excavation of a road or adjacent footpath for which council is the roads authority and responsible for maintenance?	Yes	Consultation has been undertaken with Cootamundra-Gundagai Regional Council, the council is generally supportive of the proposal. Council's requirements for the local road network have been incorporated into the design.	Section 2.10

Local heritage items

Development type	Potential impact	Yes / No	If 'yes' consult with the relevant local council(s).	SEPP (Transport and Infrastructure) section
Local heritage	Is there is a local heritage item (that is not also a State heritage item) or a heritage conservation area in the study area for the works? If yes, does a heritage assessment indicate that the potential impacts to the heritage significance of the item/area are more than minor or inconsequential?	No		Section 2.11

Flood liable land

Development type	Potential impact	Yes / No	If 'yes' consult with	SEPP (Transport and Infrastructure) section
Flood liable land	Are the works located on flood liable land? If so, will the works change flood patterns to more than a minor extent?	No		Section 2.12
Flood liable land	Are the works located on flood liable land? (to any extent). If so, do the works comprise more than minor alterations or additions to, or the demolition of, a building, emergency works or routine maintenance	No	State Emergency Services Email: erm@ses.nsw.gov.au	Section 2.13

Note: Flood liable land means land that is susceptible to flooding by the probable maximum flood event, identified in accordance with the principles set out in the manual entitled Floodplain Development Manual: the management of flood liable land published by the New South Wales Government.

Public authorities other than councils

Development type	Potential impact	Yes / No	If 'yes' consult with the relevant local council(s).	SEPP (Transport and Infrastructure) section
National parks and reserves	Are the works adjacent to a national park or nature reserve, or other area reserved under the *National Parks and Wildlife Act 1974*, or on land acquired under that Act?	No	DPE	Section 2.15
National parks and reserves	Are the works on land in Zone E1 National Parks and Nature Reserves or in a land use zone equivalent to that zone?	No	DPE	Section 2.15
Aquatic reserves and marine parks	Are the works adjacent to an aquatic reserve or a marine park declared under the *Marine Estate Management Act 2014*?	No	Department of Industry	Section 2.15
Sydney Harbour foreshore	Are the works in the Sydney Harbour Foreshore Area as defined by the *Sydney Harbour Foreshore Authority Act 1998*?	No	Sydney Harbour Foreshore Authority	Section 2.15
Bush fire prone land	Are the works for the purpose of residential development, an educational establishment, a health services facility, a correctional centre or group home in bush fire prone land?	No	Rural Fire Service	Section 2.15
Artificial light	Would the works increase the amount of artificial light in the night sky and that is on land within the dark sky region as identified on the dark sky region map? (Note: the dark sky region is within 200 kilometres of the Siding Spring Observatory)	No	Director of the Siding Spring Observatory	Section 2.15
Defence communications buffer land	Are the works on buffer land around the defence communications facility near Morundah? (Note: refer to Defence Communications Facility Buffer Map referred to in section 5.15 of Lockhart LEP 2012, Narrandera LEP 2013 and Urana LEP 2011).	No	Secretary of the Commonwealth Department of Defence	Section 2.15

Development type	Potential impact	Yes / No	If 'yes' consult with the relevant local council(s).	SEPP (Transport and Infrastructure) section
Mine subsidence land	Are the works on land in a mine subsidence district within the meaning of the *Mine Subsidence Compensation Act 1961*?	No	Mine Subsidence Board	Section 2.15

F.2 SEPP (Precincts – Central River City) 2021 and SEPP (Precincts – Western Parkland City) 2021

Development type	Potential impact	Yes / No	If 'yes' consult with the relevant local council(s).	SEPP (Transport and Infrastructure) section
Clearing native vegetation	Do the works involve clearing native vegetation (as defined in the Local Land Services Act 2013) on land that is not subject land (as defined in cl 17 of schedule 7 of the *Threatened Species Conservation Act 1995*)?	No	Department of Planning and Environment	Section 3.24

Appendix G PACHCI Stage 2 report

23 January 2025

Paul Amos
Senior Environment and Sustainability Officer
Transport for NSW

paul.amos@transport.nsw.gov.au

Dear Paul,

Re: 240681 –Wallendbeen Bridge over Rail- Stage 2 PACHCI

Transport for New South Wales (TfNSW) (the Proponent) has engaged NGH Pty Ltd (NGH) to undertake a site survey in accordance with Stage 2 of the *Procedure for Aboriginal Cultural Heritage Consultation and Investigation* (PACHCI) (NSW Roads and Maritime Services 2011) for the proposed raising and realigning of the local roads adjacent to the new bridge over the Main Southern Railway line on the Burley Griffin Way at Wallendbeen, in the Cootamundra-Gundagai Regional Council Local Government Area (LGA).

The new bridge is on a parallel alignment about 20m southwest of the original bridge alignment. The new bridge has increased vertical clearance above the rail line to facilitate future double stacking of containers on trains. The height of new bridge deck over the railway would be about three metres higher than the old bridge. Consequently, the new road pavement on both sides of the new bridge has to be raised to meet the increased height of the new bridge. The higher approach to the new bridge requires the approach and intersections with Burley Griffin Way and local roads (Silo Road, Morrisons Hill Road, North Jindalee Road and Cemetery Road) to be raised and realigned. Additionally, several ancillary areas are proposed for use as compound(s) and stockpiling of materials for these works.

This brief letter style Aboriginal Due Diligence assessment, which has been undertaken in accordance with Stage 2 of the PACHCI, will form part of an addendum to the Review of Environmental Factors (REF) for the works. This site survey and assessment was undertaken by a qualified archaeologist from NGH to evaluate the presence or potential for Aboriginal objects to occur and be affected by the proposed development activity. The assessment was undertaken in line with the sequence of steps identified in the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (OEH 2010) (Code of *Practice)* and Stage 2 of the PACHCI.

An assessment, which included a site survey by a qualified archaeologist with a representative of the Young Local Aboriginal Land Council (LALC), determined that the proposed development works would have negligible potential to impact on Aboriginal objects. Given this, the proposed works can proceed with caution with the following recommendations:

1. All works must be constrained to the assessed areas, including stockpile locations. Any activity proposed outside of the assessment areas should also be subject to an Aboriginal heritage assessment.
2. All access to the work area and stockpile locations must be within existing roads and disturbed areas, otherwise visual inspection by a qualified archaeologist may be required.
3. If any items suspected of being Aboriginal in origin are discovered during the work, all work in the immediate vicinity must stop and the TfNSW Unexpected Heritage Items Procedure must to be followed.

4. In the unlikely event that human remains are identified, all work must cease in the immediate vicinity and the TfNSW Unexpected Heritage Items Procedure must to be followed.

The Proponent is reminded that it is an offence under the *NSW National Parks and Wildlife Act 1974* to disturb, damage or destroy and Aboriginal object without a valid approval to do so.

If you have any questions reading this assessment, please contact me on 0409 002 289. I would be pleased to discuss any aspect of this project with you further.

Yours sincerely,



Kirsten Bradley
Principal Heritage Consultant
NGH Pty Ltd

A.1 Overbridge at Wallendbeen - Stage 2 PACHCI

This brief letter style report has been drafted in keeping with the sequence of steps identified in the NSW Office of Environment and Heritage's *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (OEH 2010) and Stage 2 of the *Procedure for Aboriginal Cultural Heritage Consultation and Investigation* (PACHCI) (NSW Roads and Maritime Services 2011) in order to:

- Identify whether Aboriginal objects (as defined by the *NSW National Parks and Wildlife Act 1974)* are, or are likely to be, present in the proposed development area;
- Determine whether or not the proposed development activities are likely to harm Aboriginal objects; and
- Test the preliminary findings made in Stage 1 PACHCI which concluded that Stage 2 PACHCI is warranted to determine if a project may harm Aboriginal cultural heritage. This would generally be done through the completion of further desktop studies and a site survey undertaken by a qualified archaeologist with an identify key Aboriginal stakeholder (ie a Local Aboriginal Land Council).

The steps below follow a logical sequence of questions, the answer to each question determines the need for the next step in the process.

Step 1. Will the activity disturb the ground surface or any culturally modified trees?

The proposed works are for the raising and realigning of the local roads adjacent to the new bridge over the Main Southern Railway line on the Burley Griffin Way at Wallendbeen, in the Cootamundra-Gundagai Regional Council Local Government Area (LGA).

The new bridge is on a parallel alignment about 20m southwest of the original bridge alignment. The new bridge has increased vertical clearance above the rail line to facilitate future double stacking of containers on trains. The height of new bridge deck over the railway would be about three metres higher than the old bridge. Consequently, the new road pavement on both sides of the new bridge has to be raised to meet the increased height of the new bridge. The higher approach to the new bridge requires the approach and intersections with Burley Griffin Way and local roads (Silo Road, Morrisons Hill Road, North Jindalee Road and Cemetery Road) to be raised and realigned. Additionally, several ancillary areas are proposed for use as compound(s) and stockpiling of materials for these works. The proposed work and laydown areas are show in Figure 1.

The key features of the proposed works include:

- Raising the height of Burley Griffin Way by about 3m at the new overbridge
- Altering the height and location of local road intersections with the Burley Griffin Way adjacent to the project
- Lifting and relocating the intersection of North Jindalee Road and Cemetery Road
- Lifting and minor realignment of the intersection of Burley Griffin Way with Morrisons Hill Road and Silo Road
- Relocation of the temporary bridge to an existing compound area for dismantling and removal using cranes and trucks.
- Using several ancillary areas for compound(s) and stockpiling of materials for the project, including the existing stockpile and laydown areas located at Bland Street, Cullinga Road, Morrisons Hill Road Cemetery Road and North Jindalee Road and at the Wallendbeen Silo.

While no previously recorded culturally modified trees are known to occur within the proposed work or stockpile areas these works will require ground disturbance using heavy machinery. Any Aboriginal objects or sites within the disturbance footprint could therefore be subject to harm. The confirmation that ground disturbance will occur requires the next step in the due diligence process.

Step 2a. Search the AHIMS database and use any other sources of information of which you are already aware.

A search of relevant heritage registers for Aboriginal sites and places provides an indication of the presence of previously recorded sites. A register search is not conclusive however, as it requires that an area has been inspected, and any sites are provided to the relevant body to add to the register. However, as a starting point, the search will indicate whether any sites are known within or adjacent to the assessment area. The Aboriginal Heritage Information Management System (AHIMS) provides a database of previously recorded Aboriginal heritage sites in NSW. A search provides basic information about any sites previously identified within a search area. The results of an AHIMS extensive search are valid for a 12 month period.

On 11 December 2024 a search of the AHIMS database was undertaken over an approximately 22km by 16km area centred on the proposed works area (Lat, Long -34.5951, 148.0406 to Lat., Long –34.457, 148.2878). The AHIMS Client Service Number was 959401. There were 39 Aboriginal sites recorded within this search area and no declared Aboriginal Places. Table Error**! No text of specified style in document.**1 shows the breakdown of the sites by type and Figure 2 shows the results of the AHIMS extensive search. No previously recorded Aboriginal sites on AHIMS were identified within in or close proximity to the works area or the proposed stockpile locations.

Table **Error! No text of specified style in document.**1 Previously recorded Aboriginal sites within the AHIMS search area.

Site Type	Number
Modified Tree (Carved or Scarred)	31
Artefact (1 or more)	5
Modified Tree (Carved or Scarred), Artefact (1 or more); Aboriginal resource and gathering	1
Aboriginal resource and gathering	1
Grinding Groove	1
TOTAL	**39**

The recorded Aboriginal site types in the region, based on the AHIMS search, are predominantly modified trees. Other site types which have been recorded in the area based on the AHIMS search include stone artefacts (1 or more), grinding groove and Aboriginal resource and gathering locations. The high proportion of modified trees recorded in the area (n=32; 79.5%), are noted to generally be with recorded within or adjacent to road corridors, specifically where there are remnant stands of native trees. Scarred and modified trees provide tangible links to the past and provide evidence of Aboriginal subsistence activities through the deliberate removal of bark or wood. It is likely that the high proportion of scarred trees in the area surrounding the works locations is related both to a lack of surveys in the area and the more obtrusive nature of scarred trees when compared to small artefact scatters and isolated stone artefacts.

Other heritage register searches were also undertaken to identify any items or places in proximity to the proposed work areas. The NSW State Heritage Inventory (SHI) includes items on the State Heritage Register and items listed by state agencies and the local Government, to identify any items currently listed within or adjacent to the work areas. The SHI database also includes declared Aboriginal Places in NSW. A search of the SHI database was conducted, which indicated there are no previously recorded Aboriginal Places listed under the *National Parks and Wildlife Act* within proximity to the proposed works area. There are 16 listed items on the Cootamundra-Gundagai Regional Local Environmental Plan (LEP) within and in close proximity to Wallendbeen, however none of these items are noted to be listed for Aboriginal significance (Black Mountain Projects Pty Ltd 2010; NGH 2019).

Step 2b. Are activities proposed in areas where landscape features indicate the presence of Aboriginal objects?

The *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (*Code of Practice) and* PACHCI outline a range of landscape features that have higher potential to contain Aboriginal objects. It is also necessary to consider whether there are landscape features of undisturbed land that may contain Aboriginal objects. These include land that is:

- within 200m of water;
- located within a sand dune system;
- located on a ridge top, ridge line or headland;
- located within 200m below or above a cliff face,
- within 20m of a cave, rock shelter or cave mouth, or
- Remnant, mature stands of vegetation.

Understanding the landscape context of the proposed work areas assists in building an archaeological predictive model of the area and assist to identify local resources which may have been utilised by Aboriginal people. This information can then potentially be used in predicting the nature of Aboriginal occupation across the landscapes within and adjacent to the proposed work areas. Factors that are typically used to inform the archaeological potential of landscapes include the presence or absence of resources that would have been utilised by Aboriginal people including water, animal and plant foods, stone and other resources.

The archaeological predictive model of the general region (NGH 2023) also notes that:

- Open campsites tend to be located near streams, especially level elevated ground and low gradient basal slopes;
- Large open campsites will occur most frequently within 100m to 150m of major drainage lines, with a possible preference for areas at the confluence of major streams;
- Open artefact scatters that occur away from major creek lines will tend to be small and sparse;
- Scarred trees may occur wherever old growth trees of sufficient age are present and may be located anywhere in the landscape.

While some of the proposed stockpile and laydown areas are located within 200m of water, all these locations are noted to be previously highly disturbed and therefore have negligible potential for Aboriginal objects.

The works for the raising and realigning of the local roads adjacent to the new bridge over the Main Southern Railway line on the Burley Griffin Way and use of the proposed Cemetery Road compound however will impact areas of remnant mature stands of vegetation and native trees which are located adjacent to the southern side of the new bridge. This landscape feature is noted in the PACHCI to be an archeologically sensitive feature due to the potential for scarred or modified trees to occur, thus the next step is required.

Step 3. Can you avoid harm to the object or disturbance of the landscape feature?

No known Aboriginal objects are located within or in close proximity to the work areas. The disturbance to the ground surface for these proposed works is however not able to avoid impacts to remnant mature stands of vegetation and native trees located south of the new bridge as the raising and realigning of the local roads must be integrated with the location of the constructed new bridge in line with standard road safety guidelines and requirements in NSW.

In accordance with the PACHCI, as this archaeological sensitive feature (remnant mature stands of vegetation) cannot be avoided, the next step (a visual inspection by a qualified archaeologist and identify key Aboriginal stakeholder) is required to be undertaken.

Step 4. Does a desktop assessment and visual inspection confirm that there are Aboriginal objects or that they are likely?

The desktop assessment revealed that the works for the raising and realigning of the local roads adjacent to the new bridge and the proposed Cemetery Road compound will impact areas of remnant mature stands of vegetation and native trees. This landscape feature is noted in the PACHCI to be an archeologically sensitive feature due to the potential for scarred or modified trees to occur, thus visual inspection was required. In line with the PACHCI, it was identified by Transport that the appropriate key Aboriginal stakeholder for the project location was the Young Local Aboriginal Land Council (LALC). A site visit of the work area and stockpile locations was subsequently conducted on 13 December 2024 by a qualified archaeologist (Kirsten Bradley, Principal Heritage Consultant, NGH) with a single site officer representative from the Young LALC and a Transport Senior Environment and Sustainability Officer.

The visual inspection was undertaken by walking and inspecting the entire works area, including the stockpile and compound areas, with particular focus on any areas of remnant mature stands of vegetation and native trees which were proposed to be impacted, and any areas of exposure or increased visibility. Plate 1 to Plate 10 show images from the survey. The ground visibility within the areas of remnant vegetation was poor due to dense leaf litter and averaged less than 5% while the ground visibility within the areas of existing tracks and disturbed areas was very good and averaged 95%.

All old growth native trees within and adjacent to the proposed works and stockpile locations were examined for the presence of Aboriginal cultural modification. For a tree to have been a mature specimen suitable for bark extraction at the time Aboriginal people were last practicing traditional ways, the tree would have to be a native species and over 100 years old. While several mature native trees were identified and inspected none had scarring that was considered to conform in any way to the standard scarring morphology accepted for Aboriginal modification (cf. Long, 2005).

The past use, construction and maintenance works along the existing road corridors, laydown and stockpile locations were noted to have resulted in the modification and significant disturbance of the proposed work areas which were determined to have low potential for Aboriginal objects. The disturbed areas and existing cuts also showed that the work areas had a shallow soil profile with limited potential for subsurface cultural deposits. No Aboriginal objects, sites or areas of potential archaeological deposit (PAD) were recorded within the work area or laydown and stockpile locations. It was determined that the proposed works has negligible potential to impact on Aboriginal heritage objects.

The Code of Practice and the PACHCI guidelines state that if, after the desktop research and visual inspection is completed, it is concluded that there are no, or unlikely to be any, Aboriginal objects impacted by the proposed activity, then the activity can proceed with caution. The desktop research and visual inspection completed for the proposed works has determined that the proposed development has negligible potential to impact on Aboriginal objects as defined by the *NSW National Parks and Wildlife Act 1974*. Given this, the proposed works can proceed with caution without further assessment in regard to Aboriginal heritage.

Recommendations

The proposed work can proceed with caution with the following recommendations:

1. All works must be constrained to the assessed areas, including stockpile locations. Any activity proposed outside of the assessment areas should also be subject to an Aboriginal heritage assessment.
2. All access to the work area and stockpile locations must be within existing roads and disturbed areas, otherwise visual inspection by a qualified archaeologist may be required.
3. If any items suspected of being Aboriginal in origin are discovered during the work, all work in the immediate vicinity must stop and Transport's Unexpected Heritage Items Procedure must to be followed.

4. In the unlikely event that human remains are identified, all work must cease in the immediate vicinity and Transport's Unexpected Heritage Items Procedure must to be followed.

The Proponent is reminded that it is an offence under the *NSW National Parks and Wildlife Act 1974* to disturb, damage or destroy and Aboriginal object without a valid approval to do so.

	
Plate 1. View northeast along Cemetery Road.	Plate 2. View southwest from the intersection of Cemetery Road and North Jindalee Road across the works area and proposed Cemetery Road compound location.
	
Plate 3. View north along Burley Griffin Way towards the bridge.	Plate 4. View west to new bridge from the intersection of Burley Griffin Way and North Jindalee Road.

	
Plate 5. View northeast along North Jindalee Road.	Plate 6. View southwest along North Jindalee Road.
	
Plate 7.Existing disturbed stockpile and laydown area- Morrisons Hill Road.	Plate 8. Existing disturbed stockpile and laydown area- Wallendbeen Silo.
	
Plate 9. Existing disturbed stockpile and laydown area- Bland Street.	Plate 10. Existing disturbed stockpile and laydown area- Cullinga Road.



Figure 1. Proposed work location and stockpile areas



Figure 2. Proposed works compared to the AHIMS search results

References

Black Mountain Projects Pty Ltd (2010) Cootamundra Shire Community-Based Heritage Study. Report prepared for Cootamundra Shire and Heritage Branch of the NSW Department of Planning.

Long, A. 2005 Aboriginal Scarred Trees in New South Wales A Field Manual. Department of Environment and Conservation, Hurstville

NGH 2019 Wallendbeen Strategic Heritage Study and King Street Revitalisation Project. Unpublished report for Cootamundra-Gundagai Regional Council.

NGH 2023 Aboriginal Archaeological Baseline Report Burley Griffin Way Road (MR84) Safety Improvements. Unpublished report for Transport

OEH, 2010. Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales.

Roads and Maritime Services 2011, Roads and Maritime Services Procedure for Aboriginal Cultural Heritage Consultation and Investigation.

Appendix H Noise and Vibration Assessment

Corridor Realignment and Replacement Bridge Over Rail at Wallendbeen

Noise and Vibration Impact Assessment

Transport for NSW

193-195 Morgan Street
Wagga Wagga NSW 2650

Prepared by:

SLR Consulting Australia

SLR Project No.: 610.032209.00001

30 January 2025

Revision: 1.0

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
1.0	30 January 2025	Jordan McMahon	A McKenzie	A McKenzie

Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Transport for NSW (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

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Appendices

Appendix A **Acoustic Terminology**

Appendix B **Ambient Noise Monitoring Results**

Appendix C **Construction Information**

Appendix D **Operational Information**

1.0 Introduction

SLR Consulting Australia Pty Ltd (SLR) has been engaged by Transport for NSW (Transport) to undertake a noise and vibration impact assessment for the road corridor realignment and replacement bridge at Wallendbeen.

The environmental impact of the bridge construction was assessed in the Review of Environmental Factors (REF) *Provision of overbridge at Wallendbeen*, November 2022. The REF was prepared prior to the road and bridge design being finalised. The detailed road design has now been completed. This Noise and Vibration Impact Assessment has been completed to support the Addendum REF which considers the detailed road design.

The assessment uses specific acoustic terminology and an explanation of common terms is included in **Appendix A.**

1.1 Project Description

Transport is currently constructing a new bridge over the Main Southern Railway line on the Burley Griffin Way in the NSW South West Slopes at Wallendbeen (the project). The original brick arch bridge was removed during emergency works after damage from heavy rainfall in March 2021. The original bridge was replaced, as emergency works, soon after with a temporary single lane bridge over the rail line for Burley Griffin Way traffic. Currently the temporary single lane bridge allows traffic through the site under traffic control.

The new bridge is on a parallel alignment about 20 m southwest of the original bridge alignment. The new bridge construction is expected to be completed by April 2025. The new bridge has increased vertical clearance above the rail line to facilitate future double stacking of containers on trains. The height of the new bridge deck over the railway would be about three metres higher than the old bridge. As a consequence, the new road alignment on both sides of the new bridge has to be raised to meet the increased height of the new bridge. The higher approaches to the new bridge also impacts the Burley Griffin Way and the intersections with the four adjacent local roads. As such the intersections and local roads are proposed to be raised and realigned.

Key features of the project include:

- Raising the height of Burley Griffin Way by about 3m at the new overbridge
- Altering the height and location of local road intersections with the Burley Griffin Way adjacent the project
    - Lifting and relocating the intersection of North Jindalee Road and Cemetery Road
    - Lifting and minor realignment of the intersection with Morrisons Hill Road and Silo Road
    - Extraction of water for road construction from existing water sources using previously disturbed areas
    - Relocation of the temporary bridge to an existing compound area for dismantling and removal using cranes and trucks
    - Using up to four ancillary areas for compound(s) and stockpiling of materials for the project including:
        - Bland Street, Wallendbeen, existing stockpile area, 900 m^2, 370 m east of the project
        - Cullinga Road, Wallendbeen, existing stockpile area, 600 m^2, 980 m southeast of the project

- Wallendbeen Silo, existing laydown, 1200 m^2, 700 m northeast of the project
- Land within the project adjacent the intersection of North Jindalle Road and Cemetery Road

2.0 Existing Environment

The project is located within the Cootamundra Gundagai Regional Council local government area. Existing noise levels in the study area are generally influenced by noise from Burley Griffin Way, Olympic Highway and the Main Southern Railway line.

Receivers near to the project are mainly residential and also include nearby outdoor horse arenas. The assessment uses two Noise Catchment Areas (NCAs) that reflect the land uses in the study area and the existing background noise levels. Receivers potentially sensitive to noise and vibration have been categorised as residential dwellings, commercial/industrial buildings, or 'other sensitive' land uses which include educational facilities and outdoor recreation areas.

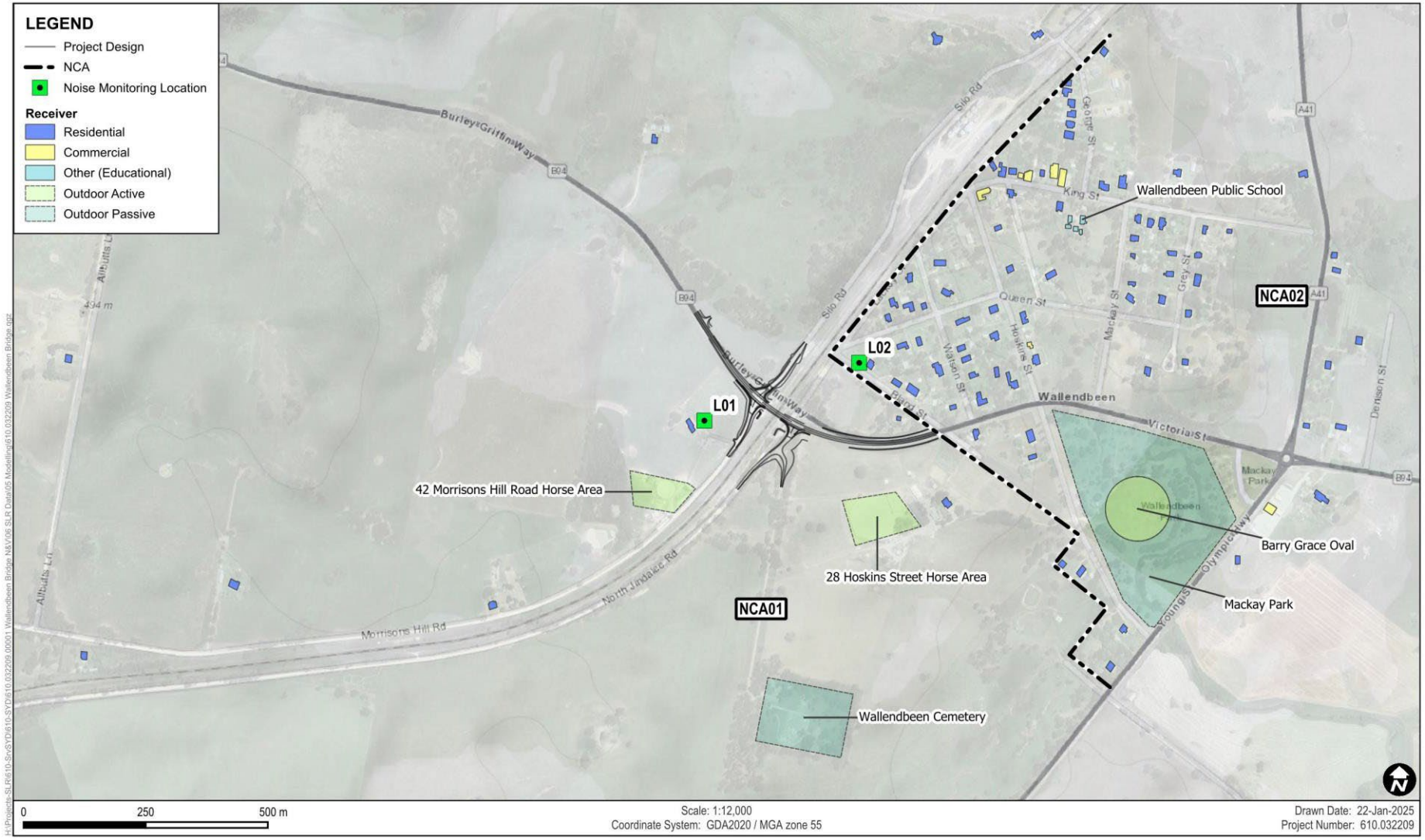
The noise study area and NCAs are described in **Table 1** and shown in **Figure 1**.

Table 1 Noise Catchment Areas and Land Uses

NCA	Description
NCA01	This NCA generally includes larger 'semi-rural' properties which are set further back from the road and rail compared to receivers in NCA02. It is mainly residential and also includes Wallendbeen Cemetery and two nearby outdoor horse arenas.
NCA02	This NCA generally includes the Wallendbeen township. It is mainly residential and also includes some commercial use on King Street, Wallendbeen Public School, Mackay Park and Barry Grace Oval.

The relevant noise guidelines do not include guidance for assessing potential noise impacts on horses. The 'outdoor active recreation' receiver category has been applied to nearby horse arenas. Note that this assessment does not include review of potential animal welfare issues such as behavioural or other health related impacts on animals in relation to noise.

Figure 1 Site Plan, Receivers and Noise Monitoring Locations



2.1 Existing Noise Surveys and Monitoring Locations

Unattended noise monitoring in the study area was completed in November 2024. The measured noise levels have been used to determine the existing noise environment and to set the criteria used to assess the potential impacts from the project.

The ambient noise monitoring was conducted during a regular (non-holiday) period for a minimum of seven days at each location. The measured existing noise levels are representative of the background noise levels at receivers that would likely be most affected by the construction and operation of the project in each NCA.

The noise monitoring equipment continuously measured existing noise levels in 15-minute periods during the daytime, evening and night-time. All equipment carried current National Association of Testing Authorities (NATA) calibration certificates and calibration was checked before and after each measurement.

The results of the noise monitoring have been analysed to exclude noise from extraneous events and data affected by adverse weather conditions, such as strong wind or rain (wind and rain were measured at a locally deployed weather station at L01), to establish representative existing noise levels for each NCA.

The noise monitoring locations are shown in **Figure 1** and the results are summarised in **Table 2**. Details of each monitoring location together with graphs of the measured daily noise levels are provided in **Appendix B**.

Table 2 Summary of Unattended Noise Monitoring Results

ID	Address	Measured Noise Level (dBA)							
		Construction[1]						Operational[2]	
		Background Noise (RBL)			Average Noise (L_{Aeq})			Average Noise (L_{Aeq})	
		Day	Eve.	Night	Day	Eve.	Night	Day	Night
L01	42 Morrisons Hill Road	35 (32 actual)[3]	30	30 (25 actual)[3]	47	48	47	47	46
L02	1-3 Bland Street	35 (32 actual)[3]	32	30 (29 actual)[3]	47	49	47	48	47

Note 1: Construction noise is assessed during the daytime which is 7 am to 6 pm, the evening which is 6 pm to 10 pm and the night-time which is 10 pm to 7 am. See the NSW EPA *Interim Construction Noise Guideline*.

Note 2: Operational road traffic noise is assessed during the daytime which is 7 am to 10 pm and the night-time which is 10 pm to 7 am. See the NSW EPA *Road Noise Policy*.

Note 3: Some of the measured RBLs were lower than the NSW EPA *Noise Policy for Industry* (NPfI) assumed minimum RBLs of 35 dBA for the daytime and 30 dBA for the evening and night.

The measured noise levels at the two locations were found to be very similar, with slightly higher evening noise levels measure at L02.

Short-term attended noise monitoring was also completed at each monitoring location. The attended measurements allow the contributions of the various noise sources at each location to be determined. Detailed observations from the attended measurements are provided in **Appendix B**.

3.0 Policy Context

3.1 Construction Noise and Vibration

3.1.1 Construction Noise and Vibration Guidelines

The main guidelines used to assess construction impacts from the project are listed in **Table 3**. The guidelines aim to protect the community and environment from excessive adverse noise and vibration impacts as projects are constructed.

Table 3 Construction Noise and Vibration Guidelines

Guideline/Policy Name	Where Guideline Used
Interim Construction Noise Guideline (ICNG) (DECC, 2009)	Assessment of airborne noise impacts on sensitive receivers
AS2107:2016 Acoustics – Recommended design sound levels and reverberation times for building interiors	Provides recommended design sound levels for internal areas of occupied spaces
Environmental Criteria for Road Traffic Noise (ECRTN) (EPA, 1999)	Contains guidance for assessing potential sleep disturbance impacts
Road Noise Policy (RNP) (DECCW, 2011)	Assessment of construction traffic impacts
BS 7385 Part 2-1993 Evaluation and measurement for vibration in buildings Part 2, BSI, 1993	Assessment of vibration impacts (structural damage) to non-heritage sensitive structures
DIN 4150:Part 3-2016 Structural vibration – Effects of vibration on structures, Deutsches Institute fur Normung, 1999	Screening assessment of vibration impacts (structural damage) to heritage sensitive structures, where the structure is found to be unsound
Assessing Vibration: a technical guideline (DEC, 2006)	Assessment of vibration impacts on sensitive receivers
Construction Noise and Vibration Guideline (Roads) (CNVG-R) (Transport, 2024)	Assessment and management protocols for airborne noise and vibration impacts for road infrastructure projects
AS2187.2:2006 Explosives – Storage and use Part 2: Use of explosives	Assessment of impacts from blasting activities

3.1.2 Interim Construction Noise Guideline

The NSW *Interim Construction Noise Guideline* (ICNG) is used to assess and manage impacts from construction noise on residences and other sensitive land uses in NSW.

The ICNG contains procedures for determining project specific Noise Management Levels (NMLs) for sensitive receivers based on the existing background noise in the area. The 'worst-case' noise levels from construction of a project are predicted and then compared to the NMLs in a 15-minute assessment period to determine the likely impact of the project.

The NMLs are not mandatory limits, however, where construction noise levels are predicted or measured to be above the NMLs, feasible and reasonable work practices to minimise noise emissions are to be investigated.

Residential Receivers

The ICNG approach for determining NMLs at residential receivers is shown in **Table 4**.

Table 4 ICNG NMLs for Residential Receivers

Time of Day	NML $L_{Aeq(15minute)}$	How to Apply
Standard Construction Hours Monday to Friday 7:00 am to 6:00 pm Saturday 8:00 am to 1:00 pm No work on Sundays or public holidays	Noise affected RBL[1] + 10 dB	• The noise affected level represents the point above which there may be some community reaction to noise • Where the predicted or measured $L_{Aeq(15minute)}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level • The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly Noise Affected 75 dBA	• The Highly Noise Affected (HNA) level represents the point above which there may be strong community reaction to noise • Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restructuring the hours that the very noisy activities can occur, taking into account: ○ Times identified by the community when they are less sensitive to noise (such as before and after school for works near schools or mid-morning or mid-afternoon for works near residences ○ If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside Standard Construction Hours	Noise affected RBL + 5 dB	• A strong justification would typically be required for works outside the recommended standard hours • The proponent should apply all feasible and reasonable work practices to meet the noise affected level • Where all feasible and reasonable practises have been applied and noise is more than 5 dB above the noise affected level, the proponent should negotiate with the community.

Note 1: The RBL is the Rating Background Level and the ICNG refers to the calculation procedures in the NSW *Industrial Noise Policy* (INP). The INP has been superseded by the NSW EPA *Noise Policy for Industry* (NPfI).

The ICNG recommends that work is completed during Standard Construction Hours where possible. More stringent requirements are placed on work that is required to be completed outside Standard Construction Hours (ie during the evening or night-time), which reflects the greater sensitivity of communities to noise impacts during these periods.

Sleep Disturbance

Infrastructure projects often require certain work to be completed during the night-time. Where night work is located close to residential receivers, there is potential for sleep disturbance impacts.

The ICNG lists five categories of work that might need to be undertaken outside of Standard Construction Hours:

- The **delivery of oversized equipment or structures** that require special arrangements to transport on public roads
- **Emergency work** to avoid the loss of life or damage to property, or to prevent environmental harm
- **Maintenance and repair of public infrastructure** where disruption to essential services or considerations of worker safety do not allow work within standard hours
- **Public infrastructure work** that shortens the length of the project and is supported by the affected community
- Work where a proponent demonstrates and justifies **a need to operate outside the recommended standard hours**.

Where construction work is planned to extend over more than two consecutive nights, the ICNG recommends that an assessment of sleep disturbance impacts should be completed. The ICNG refers to the *NSW Environmental Criteria for Road Traffic Noise* for assessing the potential impacts, which notes that to limit the level of sleep disturbance, the L_1 level (or L_{Amax}) should not exceed the existing L90 background noise level by more than 15 dB.

Summary of Residential NMLs

The residential NMLs for the project have been determined in accordance with the requirements of the ICNG using the results from the unattended existing noise monitoring (see **Section 2.0**) and are shown in **Table 5**.

Table 5 Residential Receiver Construction Noise Management Levels

NCA	Representative Background Monitoring Location	Noise Management Level ($L_{Aeq(15minute)}$ - dBA)				Sleep Disturbance Screening Criteria (RBL +15dB)
		Standard Daytime (RBL +10dB)	Out of Hours			
			Daytime[1] (RBL +5dB)	Evening (RBL +5dB)	Night-time (RBL +5dB)	
NCA01	L.01	45	40	35	35	45
NCA02	L.02	45	40	37	35	45

Note 1: Daytime out of hours is 7 am to 8 am and 1 pm to 6 pm on Saturday, and 8 am to 6 pm on Sunday and public holidays.

Other Sensitive Land Uses and Commercial Receivers

Several non-residential land uses have been identified in the study area. The NMLs for 'other sensitive' receivers are shown in **Table 6**.

Table 6 NMLs for 'Other Sensitive' Receivers

Land Use	Noise Management Level LAeq(15minute) (dBA) (Applied when the property is in use)	
	Internal	External
ICNG 'Other Sensitive' Receivers		
Classrooms at schools and other educational institutions	45	55[1]
Active recreation areas (characterised by sporting activities which generate noise)	-	65
Passive recreation areas (characterised by contemplative activities that generate little noise)	-	60
Commercial	-	70

Note 1: It is assumed that these receivers have windows partially open for ventilation which results in internal noise levels being around 10 dB lower than the external noise level.

3.1.3 Construction Traffic Noise Guidelines

The potential impacts from construction traffic associated with the project when travelling on public roads are assessed under the NSW EPA *Road Noise Policy* (RNP) and Transport's *Construction Noise and Vibration Guideline (Roads)* (CNVG-R).

An initial screening test is first applied to evaluate if existing road traffic noise levels are expected to increase by more than 2.0 dB as a result of construction traffic. Where this is considered likely, further assessment is required using the RNP and the Transport's *Road Noise Criteria Guideline* (RNCG) base criteria shown in **Table 7**.

Table 7 RNP/RNCG Criteria for Assessing Construction Traffic on Public Roads

Road Category	Type of Project/Land Use	Assessment Criteria (dBA)	
		Daytime (7 am – 10 pm)	Night-time (10 pm – 7 am)
Freeway/ arterial/ sub-arterial roads	Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments	$L_{Aeq(15hour)}$ 60 (external)	$L_{Aeq(9hour)}$ 55 (external)
Local roads	Existing residences affected by additional traffic on existing local roads generated by land use developments	$L_{Aeq(1hour)}$ 55 (external)	$L_{Aeq(1hour)}$ 50 (external)

3.1.4 Construction Vibration Guidelines

The effects of vibration from construction work can be divided into three categories:

- Those in which the occupants of buildings are disturbed (**human comfort**). People can sometimes perceive vibration impacts when vibration generating construction work is located close to occupied buildings. Vibration from construction work tends to be intermittent in nature and the EPA's *Assessing Vibration: a technical guideline* (2006) provides criteria for intermittent vibration based on the Vibration Dose Value (VDV), as shown in **Table 8**. While the construction activities for the project are generally not expected to result in continuous or impulsive vibration impacts, criteria are provided in **Table 9**.
- Those where building contents may be affected (**building contents**). People perceive vibration at levels well below those likely to cause damage to building contents. For most receivers, the human comfort vibration criteria are the most stringent and it is generally not necessary to set separate criteria for vibration effects on typical building contents. Exceptions to this can occur when vibration sensitive equipment, such as electron microscopes or medical imaging equipment, are in buildings near to construction work. No such equipment has been identified in the study area.
- Those where the integrity of the building may be compromised (**structural/cosmetic damage**). If vibration from construction work is sufficiently high it can cause cosmetic damage to elements of affected buildings. Industry standard cosmetic damage vibration limits are specified in British Standard BS 7385 and German Standard DIN 4150. The limits are shown in **Table 10** and **Table 11**.

Table 8 Human Comfort Vibration – Vibration Dose Values for Intermittent Vibration

Building Type	Assessment Period	Vibration Dose Value[1] ($m/s^{1.75}$)	
		Preferred	Maximum
Critical Working Areas (eg operating theatres or laboratories)	Day or night-time	0.10	0.20
Residential	Daytime	0.20	0.40
	Night-time	0.13	0.26
Offices, schools, educational institutions and places of worship	Day or night-time	0.40	0.80
Workshops	Day or night-time	0.80	1.60

Note 1: The VDV accumulates vibration energy over the daytime and night-time assessment periods, and is dependent on the level of vibration as well as the duration.

Table 9 Human Comfort Vibration – Preferred and Maximum Weighted Root Mean Square Values for Continuous and Impulsive Vibration Acceleration (m/s^2) 1–80 Hz

Location	Assessment period	Preferred values		Maximum values	
		z-axis	x- and y-axis	z-axis	x- and y-axis
Continuous vibration					
Residential	Daytime	0.010	0.0071	0.020	0.014
	Night-time	0.007	0.005	0.014	0.010
Offices, schools, educational institutions and places of worship	Day or night-time	0.020	0.014	0.040	0.028
Workshops	Day or night-time	0.04	0.029	0.080	0.058
Impulsive vibration					
Residential	Daytime	0.30	0.21	0.60	0.42
	Night-time	0.10	0.071	0.20	0.14
Offices, schools, educational institutions and places of worship	Day or night-time	0.64	0.46	1.28	0.92
Workshops	Day or night-time	0.64	0.46	1.28	0.92

Table 10 Cosmetic Damage – BS 7385 Transient Vibration Values for Minimal Risk of Damage

Group	Type of Building	Peak Component Particle Velocity in Frequency Range of Predominant Pulse	
		4 Hz to 15 Hz	15 Hz and Above
1	Reinforced or framed structures. Industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	
2	Unreinforced or light framed structures. Residential or light commercial type buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

Note 1: Where the dynamic loading caused by continuous vibration may give rise to dynamic magnification due to resonance, especially at the lower frequencies where lower guide values apply, then the guide values may need to be reduced by up to 50%.

Table 11 Cosmetic Damage – DIN 4150 Guideline Values for Short-term Vibration on Structures

Group	Type of Structure	Guideline Values Vibration Velocity (mm/s)				
		Foundation, All Directions at a Frequency of			Topmost Floor, Horizontal	Floor Slabs, Vertical
		1 to 10 Hz	10 to 50 Hz	50 to 100 Hz	All frequencies	All frequencies
1	Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40	20
2	Residential buildings and buildings of similar design and/or occupancy	5	5 to 15	15 to 20	15	20
3	Structures that, because of their particular sensitivity to vibration, cannot be classified as Group 1 or 2 **and** are of great intrinsic value (eg heritage listed buildings)	3	3 to 8	8 to 10	8	20[1]

Note 1: It may be necessary to lower the relevant guideline value markedly to prevent minor damage.

3.1.5 Heritage Buildings or Structures

Heritage listed buildings and structures should be considered on a case-by-case basis but as noted in BS 7385 should not be assumed to be more sensitive to vibration, unless structurally unsound. Where a heritage building is deemed to be sensitive, the more stringent DIN 4150 Group 3 guideline values in **Table 11** can be applied.

3.1.6 Minimum Working Distances for Vibration Intensive Works

Minimum working distances for typical vibration intensive construction equipment are provided in the CNVG-R and are shown in **Table 12**. The minimum working distances are for both cosmetic damage (from BS 7385 and DIN 4150) and human comfort (from the NSW EPA *Assessing Vibration: a technical guideline*). They are calculated from empirical data which suggests that where work is further from receivers than the quoted minimum distances then impacts are not considered likely.

Table 12 Recommended Minimum Working Distances from Vibration Intensive Equipment

Plant Item	Rating/Description	Minimum Distance	
		Cosmetic Damage Residential and Light Commercial (BS 7385)	Human Response (NSW EPA Guideline)
Vibratory Roller	<50 kN (1–2 tonne)	5 m	15 m to 20 m
	<100 kN (2–4 tonne)	6 m	20 m
	<200 kN (4–6 tonne)	12 m	40 m
	<300 kN (7–13 tonne)	15 m	100 m
	>300 kN (13–18 tonne)	20 m	100 m
	>300 kN (>18 tonne)	25 m	100 m

Plant Item	Rating/Description	Minimum Distance	
		Cosmetic Damage Residential and Light Commercial (BS 7385)	Human Response (NSW EPA Guideline)
Small Hydraulic Hammer	300 kg (5 to 12 t excavator)	2 m	7 m
Medium Hydraulic Hammer	900 kg (12 to 18 t excavator)	7 m	23 m
Large Hydraulic Hammer	1,600 kg (18 to 34 t excavator)	22 m	73 m
Vibratory Pile Driver	Sheet piles	2 m to 20 m	20 m
Piling Rig – Bored	≤ 800 mm	2 m (nominal)	4 m
Jackhammer	Hand held	1 m (nominal)	2 m

The minimum working distances are indicative and will vary depending on the particular item of equipment and local geotechnical conditions. The distances apply to cosmetic damage of typical buildings under typical geotechnical conditions.

3.2 Operational Noise and Vibration Guidelines

The guidelines used to assess the potential operational road traffic noise impacts from the project are listed in **Table 13**. The guidelines aim to protect the community and environment from excessive noise and vibration impacts from the long-term operation of projects.

Table 13 Operational Road Traffic Noise and Vibration Guidelines

Guideline/Policy Name	When Guideline is Used
Road Noise Policy (RNP) (DECCW, 2011)	Operational road traffic noise assessment
Road Noise Criteria Guideline (RNCG) (Transport 2023)	Defines Transport's interpretation of the RNP and details how criteria are applied to sensitive receivers
Road Noise Mitigation Guideline (RNMG) (Transport, 2024)	Details how additional mitigation measures are to be applied to Transport's road infrastructure projects
Road Noise Model Validation Guideline (RNMVG) (Transport, 2022)	Contains procedures for validating operational road traffic noise models
Noise and Vibration Assessment Procedure (for road traffic and construction) (Transport, 2023)	Defines how to complete operational road traffic noise and vibration assessments
AS2107:2016 Acoustics – Recommended design sound levels and reverberation times for building interiors	Provides recommended design sound levels for internal areas of occupied spaces.
At-Receiver Noise Treatment Guideline (draft) (Transport, 2023)	Provides an overview and discussion of feasible and reasonable at-receiver noise mitigation measures

3.2.1 Airborne Noise – Road Noise Policy and Noise Criteria Guideline

The NSW *Road Noise Policy* (RNP) is used to assess and manage potential airborne noise impact from new and redeveloped road projects.

This assessment is undertaken with guidance from the *Road Noise Criteria Guideline* (RNCG) which is Transport's interpretation of the RNP and provides a consistent approach to identifying road noise criteria for infrastructure projects.

The RNP and RNCG provide non-mandatory criteria for residential and 'other sensitive' land uses. Where a project results in road traffic noise levels which are predicted to be above the criteria, the project should investigate feasible and reasonable noise mitigation measures to minimise the impacts.

The RNP and RNCG use the following terms to describe and assess the impacts from road projects:

- '**No Build**' – the assessment scenario used to predict noise levels if the project were not to go ahead
- '**Build**' – the assessment scenario used to predict noise levels with the project.

The difference between the 'Build' and the 'No Build' noise levels is used to determine the impact of the project.

3.2.1.1 Residential Receivers

A road is 'redeveloped' where works are in an existing road corridor and the existing road is not substantially realigned. Roads are classed as 'new' where the road construction is in an undeveloped corridor, where an existing road is substantially realigned or where the functional class of a road changes, such as where a local road becomes a larger collector road.

The RNCG also defines 'minor works' which includes minor road realignments that are not intended to increase the traffic carrying capacity of the road. For 'minor works' projects, the RNCG applies the RNP target noise abatement levels for existing roads if the project increases noise levels by more than 2.0 dBA at the worst affected receiver. The project is generally considered to be 'minor works' as defined in the RNCG, however, the detailed assessment in this report has conservatively been completed on the basis the project is considered as a 'redeveloped' road.

The relevant noise criteria for residential receivers affected by traffic noise are shown in **Table 14** based on the type of road as noted above.

Table 14 RNCG Criteria for Residential Receivers

Road Category	Type of Project/Land Use	Assessment Criteria (dBA)	
		Daytime (7 am – 10 pm)	Night-time (10 pm – 7 am)
Freeway/ arterial/ sub-arterial roads	1. Existing residences affected by noise from **new** freeway/arterial/sub-arterial road corridors	$L_{Aeq(15\ hour)}$ 55 (external)	$L_{Aeq(9\ hour)}$ 50 (external)
	2. Existing residences affected by noise from **redevelopment** of existing freeway/arterial/sub-arterial roads	$L_{Aeq(15\ hour)}$ 60 (external)	$L_{Aeq(9\ hour)}$ 55 (external)
	3. Existing residences affected by **additional traffic** on existing freeways/arterial/sub-arterial roads generated by land use developments		
	4. Existing residences affected by both new roads and the redevelopment of existing freeway/arterial/sub-arterial roads in a **transition zone**[1]	Between $L_{Aeq(15hour)}$ 55-60 (external)	Between $L_{Aeq(9hour)}$ 50-55 (external)
	5. Existing residences affected by increases in traffic noise of 12 dB or more from **new** freeway/arterial/sub-arterial roads[2]	Between $L_{Aeq(15hour)}$ 42-55 (external)	Between $L_{Aeq(9hour)}$ 42-50 (external)
	6. Existing residences affected by increases in traffic noise of 12 dB or more from **redevelopment** of existing freeway/arterial/sub-arterial roads[2]	Between $L_{Aeq(15hour)}$ 42-60 (external)	Between $L_{Aeq(9hour)}$ 42-55 (external)
Local Roads	7. Existing residences affected by noise from new local road corridors	$L_{Aeq(1hour)}$ 55 (external)	$L_{Aeq(1hour)}$ 50 (external)
	8. Existing residences affected by noise from redevelopment of existing local roads		
	9. Existing residences affected by additional traffic on existing local roads generated by land use developments		

Note 1: The criteria are assigned to the entire residence and depend on the proportion of noise coming from new and redeveloped roads.

Note 2: The relative increase criterion at each facade is determined from the existing traffic noise level plus 12 dB.

The criteria are lower for the night-time due to the greater sensitivity of communities to noise impacts during this period.

The RNP and RNCG require noise to be assessed at project opening and for a future year, which is typically ten years after opening. For this project, the at-opening year is 2025 and the future year is 2035.

3.2.1.2 'Other Sensitive' Land Uses

Several 'other sensitive' non-residential land uses have been identified in the study area. The noise criteria for these receivers are shown in **Table 15**. The RNCG does not consider commercial and industrial receivers as being sensitive to operational airborne road traffic noise impacts.

Table 15 RNCG Criteria for Other Sensitive Receivers

Existing Sensitive Land Use	Assessment Criteria (dB)		Additional Considerations
	Daytime (7 am – 10 pm)	Night-time (10 pm – 7 am)	
1. School classrooms	$L_{Aeq(1\ hour)}$ 40 (internal)[1]	-	In the case of buildings used for education or health care, noise level criteria for spaces other than classrooms and wards may be obtained by interpolation from the 'maximum' levels shown in Australian Standard 2107:2000 (Standards Australia 2000).
2. Hospital wards	$L_{Aeq(1\ hour)}$ 35 (internal)	$L_{Aeq(1\ hour)}$ 35 (internal)	
3. Places of worship	$L_{Aeq(1\ hour)}$ 40 (internal)	$L_{Aeq(1\ hour)}$ 40 (internal)[1]	The criteria are internal, ie the inside of a church. Areas outside the place of worship, such as a churchyard or cemetery, may also be a place of worship. Therefore, in determining appropriate criteria for such external areas, it should be established what is in these areas that may be affected by road traffic noise.
4. Open space (active use	$L_{Aeq(15\ hour)}$ 60 (external)	-	Active recreation is characterised by sporting activities and activities which generate their own noise or focus for participants, making them less sensitive to external noise intrusion.
5. Open space (passive use)	$L_{Aeq(15\ hour)}$ 55 (external)	-	Passive recreation is characterised by contemplative activities that generate little noise and where benefits are compromised by external noise intrusion (eg playing chess, reading).
6. Child care facilities	Sleeping rooms $L_{Aeq(1\ hour)}$ 35 (internal)[1] Indoor play areas $L_{Aeq(1\ hour)}$ 40 (internal) Outdoor play areas $L_{Aeq(1\ hour)}$ 55 (internal)	-	Multipurpose spaces (eg shared indoor play/sleeping rooms) should meet the lower of the respective criteria. Measurements for sleeping rooms should be taken during designated sleeping times for the facility, or if these are not known, during the highest hourly traffic noise level during the opening hours of the facility.
7. Aged care facilities	-	-	The criteria for residential land uses should be applied to these facilities.

Note 1: The criteria are specified as an internal noise level for this receiver category. As the noise model predicts external noise levels, it has been conservatively assumed that schools have openable windows and external noise levels are 10 dB higher than the corresponding internal level, which is representative of windows being partially open to provide ventilation.

4.0 Methodology

4.1 Construction Airborne Noise Assessment Methodology

A noise model of the study area has been used to predict noise levels from the proposed construction work to all surrounding receivers. The model uses ISO 9613 algorithms in SoundPLAN V8.2 software.

Local terrain, receiver buildings and structures were digitised in the noise model to develop a three-dimensional representation of the construction sites and surrounding areas.

4.1.1 Work Descriptions

Representative scenarios have been developed to assess the likely impacts from the various construction phases of the project. These scenarios are described in **Table 16**.

The scenarios represent one possible way that the project could be constructed and may not necessarily be the same methodology that the contractor engaged to construct the project would use. At the time of writing the new bridge is in place and therefore bridge construction is not included in this assessment.

The assessment uses ‘realistic worst-case’ scenarios to determine the impacts from the noisiest 15-minute period that are likely to occur for each work scenario, as required by the ICNG. The impacts represent construction noise levels without mitigation applied.

The scenarios have been separated into ‘peak’ and ‘typical’ work scenarios. The ‘peak’ work scenarios represent the noisiest stages that require noise intensive equipment. While ‘peak’ work would be required at certain times in most locations, the highest noise impact work would generally only last for relatively short periods of the overall work duration. The ‘typical’ work scenarios represent typical noise emissions from the project when the most noise intensive equipment is not in use.

The assessment is generally considered conservative as the calculations assume several items of construction equipment are in use at the same time within individual scenarios.

Table 16 Construction Scenario Descriptions

ID	Scenario[1]	Description
W.01	Site Establishment and Early Work - Typical	This work would include: • Site compound construction, fencing, installation of environmental controls • Utility adjustment and tree removal / trimming. Peak work would generally include noise intensive equipment such as chainsaws and chippers. Typical work would generally include supporting equipment such as excavators, loaders, trucks and cranes.
W.02	Site Establishment and Early Work - Peak	
W.03	Earthwork and Drainage - Typical	This work would include: • Removal of topsoil, stockpiling and/or disposal • Earthwork including preparation of new pavement areas, foundation treatment, grading and compacting • Installing/altering drainage infrastructure, as required. Peak work would generally include noise intensive equipment such as vibratory rollers and graders. Typical work would generally include supporting equipment such as excavators, loaders, trucks and street sweepers.
W.04	Earthwork and Drainage - Peak	

ID	Scenario[1]	Description
W.05	Road Work - Typical	This work would include: • construction of the pavement layers including the subbase and asphalt layers on the new bridge approaches • tie-ins to pavement at existing road. Peak work would generally include noise intensive equipment such as vibratory rollers, pavement laying machines and pavement profilers. Typical work would generally include supporting equipment such as excavators, loaders, trucks and street sweepers.
W.06	Road Work - Peak	
W.07	Landscaping and Finishing Work - Typical	This work would include: • installation of road furniture • pavement marking • landscaping work • removal of all remaining temporary work such as traffic control barriers and ancillary facilities. Peak work would generally include noise intensive equipment such as vibratory rollers, graders and pneumatic hammers. Typical work would generally include supporting equipment such as excavators, loaders, line marking equipment and street sweepers.
W.08	Landscaping and Finishing Work - Peak	
W.09	Compounds and Stockpiles - Typical	This work would include: • bulk material storage and laydown area • plant and equipment storage • construction worker parking and site offices • stockpile management Typical work would generally include supporting equipment such as excavators, loaders, trucks and street sweepers.
W.10	Compounds - Peak	This work would include disassembly of the temporary modular bridge. Peak work would generally include noise intensive equipment such as cranes and pneumatic hammers.

Note 1: Equipment lists for each scenario and Sound Power Level data are provided in **Appendix C**.

The locations of the various work scenarios are shown in **Figure 2** to **Figure 4**.

Figure 2 Construction Works Locations – W.01, W.02, W.07, W.08

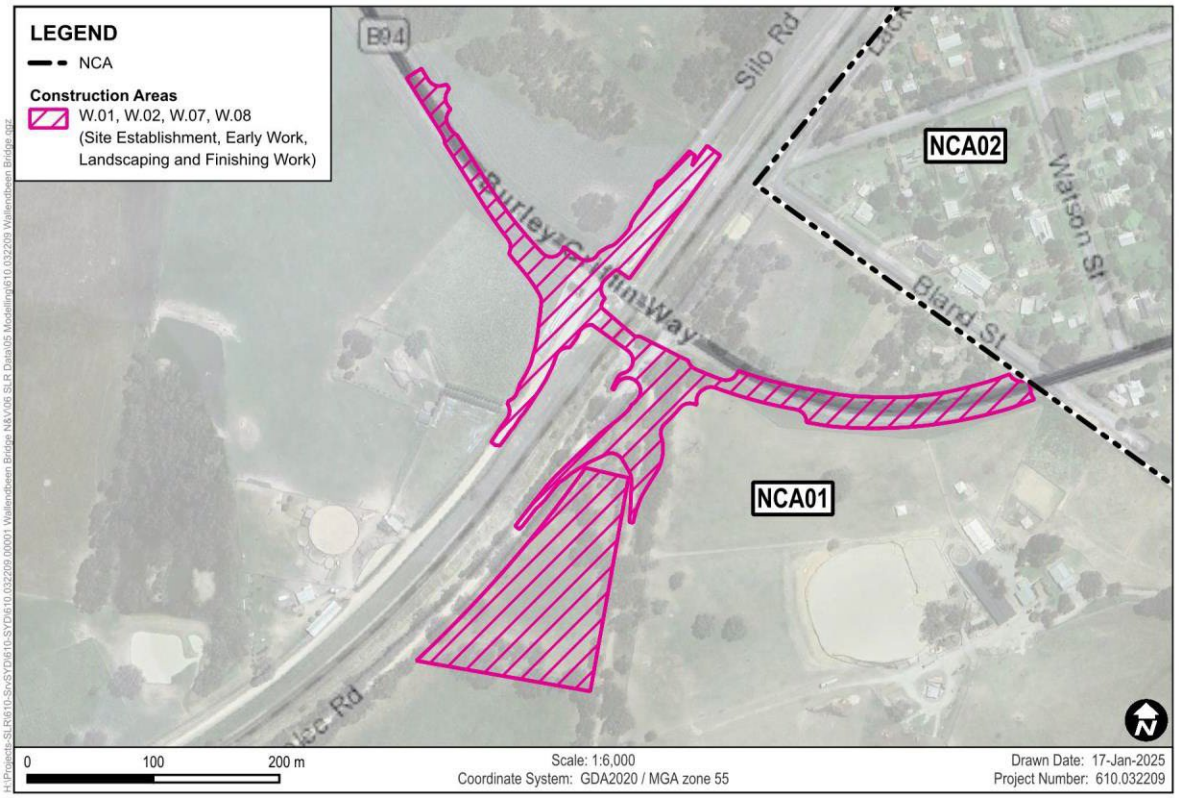


Figure 3 Construction Works Locations – W.03, W.04, W.05, W.06

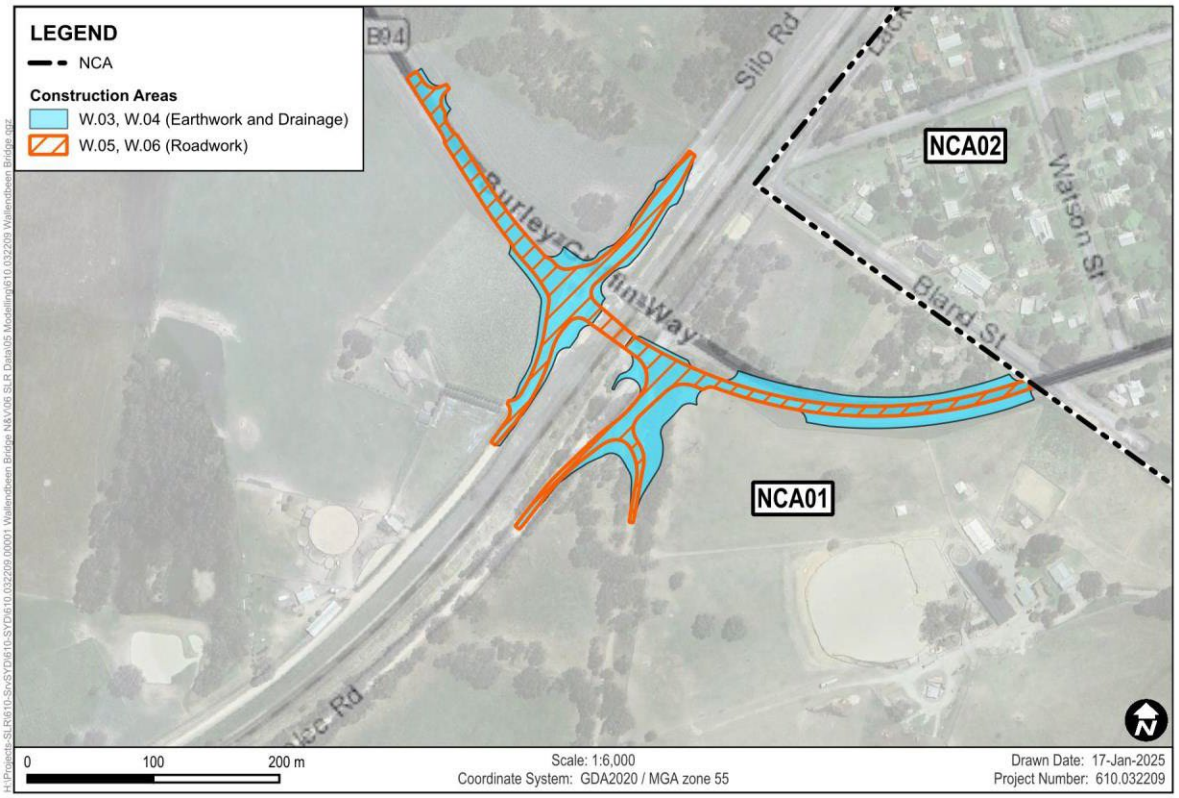
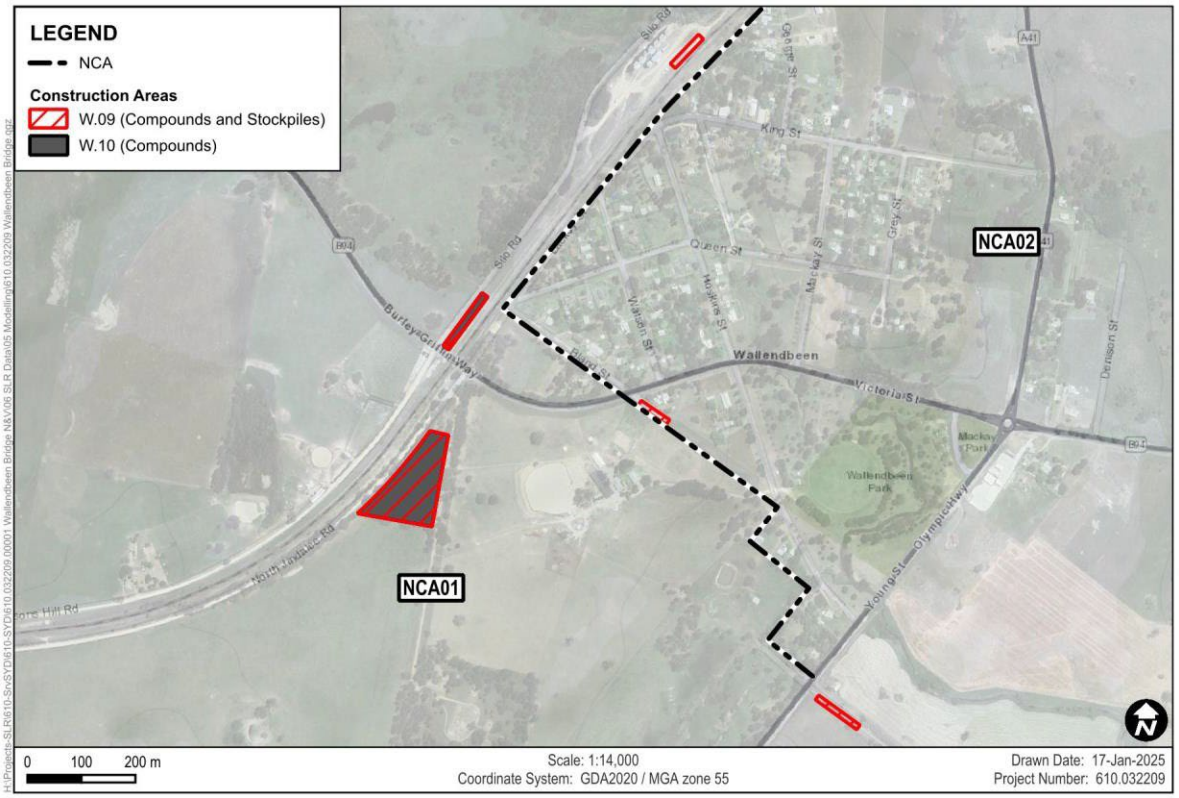


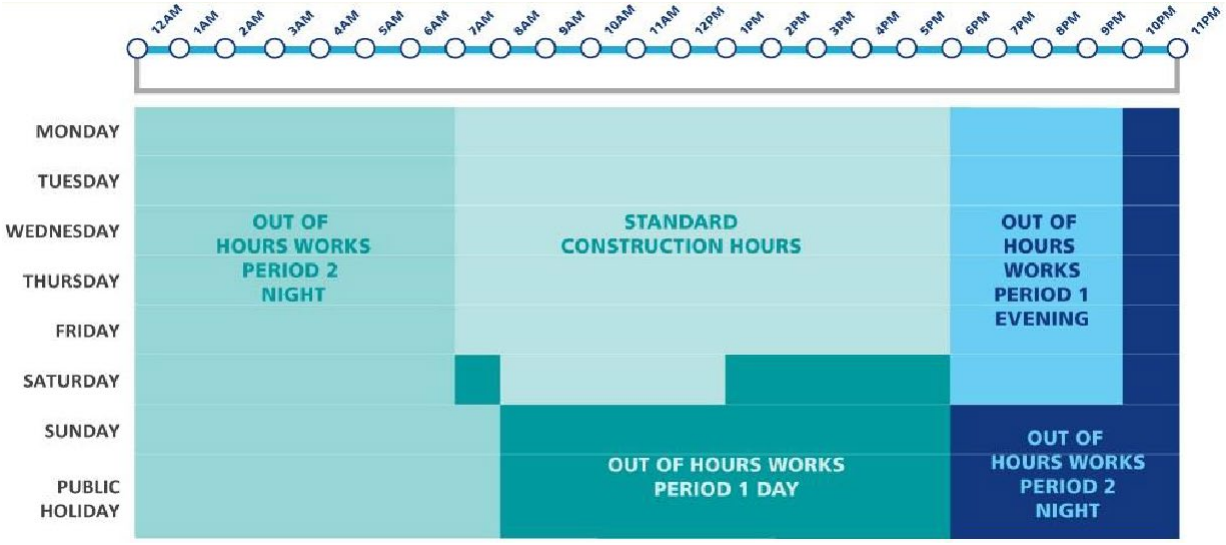
Figure 4 Construction Works Locations – W.09, W.10



4.1.2 Work Hours

Construction of the project would be carried out during Standard Construction Hours where possible. Standard Construction Hours are defined in the ICNG and shown in **Table 17**.

Table 17 Standard Construction Hours[1,2,3]



Note 1: Taken from Transport's *Construction Noise and Vibration Strategy*.

Note 2: Standard Construction Hours are Monday to Friday 7 am to 6 pm and Saturdays from 8 am to 1 pm, as defined in the ICNG.

Note 3: Work outside of Standard Construction Hours is defined as 'Out-of-Hours Work' (OOHW) and can be divided into two periods of sensitivity. OOHW Period 1 which relates to evening (and weekend daytime) work, and OOHW Period 2 which relates to night-time (and weekend evening) work.

All construction activities may be required outside of Standard Construction Hours during evening and night-time periods based on worker shifts. Shifts may start at 6 am on weekdays, include 7 am to 5 pm on Saturdays, and may also include Sundays (if work is completed under a 10 days on / 4 days off rotation). However, no noise intensive machinery or activities are expected before 7 am on weekdays and 8 am on weekends. Therefore, all construction activities have been assessed during OOHW period 1 and all 'typical' (less noise intensive) scenarios have been assessed during OOHW period 2.

Construction activities that may result in traffic restrictions are likely to be carried out outside of Standard Construction Hours during evening and night-time periods to minimise disruption to traffic and provide a safer working environment for construction workers. Therefore, roadwork has been assessed during OOHW period 1 and period 2.

The expected periods in which the works would be completed are shown in **Table 18**.

Table 18 Construction Scenarios – Working Hours

ID	Scenario	Hours of Work			
		Std. Day	Day OOH[1]	Evening	Night-time
W.01	Site Establishment and Early Work - Typical	✓	✓	✓	✓
W.02	Site Establishment and Early Work - Peak	✓	✓	-	-
W.03	Earthwork and Drainage - Typical	✓	✓	✓	✓
W.04	Earthwork and Drainage - Peak	✓	✓	-	-
W.05	Road Work - Typical	✓	✓	✓	✓
W.06	Road Work - Peak	✓	✓	✓	✓
W.07	Landscaping and Finishing Work - Typical	✓	✓	✓	✓
W.08	Landscaping and Finishing Work - Peak	✓	✓	-	-
W.09	Compounds and Stockpiles - Typical	✓	✓	✓	✓
W.10	Compounds - Peak	✓	✓	-	-

Note 1: OOH = Out of Hours. Daytime out of hours is Saturday between 7 am to 8 am and 1 pm to 6 pm, on Sunday and public holidays between 8 am to 6 pm.

4.2 Construction Vibration Assessment

The potential impacts during vibration intensive work have been assessed using the CNVG-R minimum working distances for cosmetic damage and human response shown in **Table 12**. The assessment identifies structures which are within the minimum working distances based on the construction scenarios with vibration intensive equipment as shown in **Table 19**.

Table 19 Vibration Intensive Equipment

ID	Scenario	Vibration Intensive Equipment	Minimum Distance	
			Cosmetic Damage Residential and Light Commercial (BS 7385)	Human Response (NSW EPA Guideline)
W.01	Site Establishment and Early Work - Peak	>300 kN (13–18 tonne)	20 m	100 m
W.03	Earthwork and Drainage - Peak			

ID	Scenario	Vibration	Minimum Distance	
		Intensive Equipment	Cosmetic Damage Residential and Light Commercial (BS 7385)	Human Response (NSW EPA Guideline)
W.05	Road Work - Peak			
W.07	Landscaping and Finishing Work - Peak			

Note 1: Other items of vibration generating equipment may be required at times during the works, however, they are expected to be less vibration intensive.

4.3 Construction Traffic

The potential impacts from construction traffic on public roads have been predicted using the *Calculation of Road Traffic Noise* (CoRTN) algorithm.

Where the criteria are found to be exceeded, feasible and reasonable mitigation and management measures should be considered.

4.4 Construction Mitigation

The ICNG acknowledges that due to the nature of construction work it is inevitable that there will be impacts where construction is near to sensitive receivers. Several approaches are used on major infrastructure projects to minimise the potential noise and vibration impacts as far as practicable.

Standard Mitigation Measures

The *Construction Noise and Vibration Guideline (Roads)* (CNVG-R) contains a number of ‘standard mitigation measures’ for mitigating and managing noise and vibration impacts during construction of road infrastructure projects.

These standard measures include items such as requiring construction contractors to complete site inductions to make workers aware of any noise and vibration specifics, completing regular monitoring to check noise and vibration levels are as expected, and checking noise emission levels from construction equipment to ensure they remain within manufacturers’ specifications. The ‘standard mitigation measures’ are shown in full in **Appendix C**.

Additional Mitigation Measures

Where noise impacts remain after the use of ‘standard mitigation measures’, the CNVG-R requires ‘additional mitigation measures’ to be applied, where feasible and reasonable. The ‘additional mitigation measures’ include items such as notification of upcoming work, using respite where there are high impacts and verification of construction noise and vibration levels. The measures are determined based on the exceedance of the management levels and are shown in **Appendix C**.

4.5 Operational Noise Modelling Methodology

4.5.1 Key Operational Features of the Project

The key features of the project that have the potential to change operational road traffic noise impacts in the study area include the Realignment of Burley Griffin Way and New bridge over the Main South Railway.

4.5.2 Noise Model

A noise model of the study area has been used to predict noise levels from the operation of the project to the surrounding receivers. The model uses *Calculation of Road Traffic Noise* (CoRTN) (UK Department of Transport, 1988) NSW Adaptation algorithms in SoundPLAN V8.2 software.

Local terrain, receiver buildings and structures were digitised in the noise model to develop a three-dimensional representation of the project and surrounding areas.

The '**No Build'** scenarios use the road alignment geometry of the previous permanent bridge prior to the damage in 2021, with all existing structures and features within the road corridor included.

The '**Build**' scenarios use the proposed design of the project, which includes the realigned road, new bridge and changes to ground levels such as cuttings and embankments.

4.5.3 Project and Non-Project Roads

Roads where design or engineering changes are proposed as part of the project are considered as 'project' roads. Existing roads with no upgrades or work occurring are considered 'non-project'.

Burley Griffin Way and the Olympic Highway have been included in the model to determine the contributions from 'project' and 'non-project' roads at individual receivers, as required by the RNCG. Project and non-project roads are shown in **Appendix D**.

4.5.4 Noise Modelling Parameters

Further details on the noise modelling parameters used in the assessment are shown in **Table 20**.

Table 20 Summary of Noise Model inputs and Parameters

Input Parameter	Source of Data
Ground topography	The noise model includes a 'digital ground model' which is an accurate 3D representation of the terrain in the study area. The ground model was constructed from LiDAR data. Existing road survey and the project design have been included in the ground model as required.
Buildings, receiver locations and floors	Buildings can provide screening to more distant locations of the study area. The buildings in the noise model were generated from a third-party database, digitised based on satellite imagery, LiDAR and a combination of automated and manual processing to identify building attributes. The buildings have been checked to be suitable for noise modelling. Building height information was not available in the study area. Single story buildings have been assumed to have 5 m height and garages are assumed to have 3 m height. The model predicts noise to every facade of every identified receiver in the assessment area at 1.5 m above ground level.

Input Parameter	Source of Data
Study area	The assessment area extends a minimum of 600 m from the centre line of the outermost traffic lane on each side of the project roads, as required by the RNP/RNCG.
Assessment timeframes	The project is assessed 'at-opening' in 2025 and in the 'future design' year in 2035.
Traffic volumes	Existing traffic volumes were measured at the same time as the noise monitoring survey. This data was used to model the existing situation and validate the operational model. No traffic forecasts have been completed for the project. Since the project is not intended to increase the traffic carrying capacity of the road, future traffic volumes have been estimated for the purpose of noise assessment based on the existing traffic measured in November 2024 and the average annual traffic growth in the area. The average annual traffic growth was determined based on nearby long-term-traffic count stations and confirmed with Transport. The traffic volumes for the 2025 and 2035 used in the assessment are shown in **Appendix D**.
Vehicle speed	Existing and future posted vehicle speeds used in the Build and No Build modelling situations: • Burley Griffin Way east of bridge – 60 km/h • Burley Griffin Way west of bridge – 100 km/h • Olympic Highway – 60 km/h / 100 km/h
Source heights and source correction	Vehicles generally emit road traffic noise at four source heights. These are represented in the noise model by the following: • Cars (at 0.5 m height with a source correction of 0.0 dB) • Truck tyres (at 0.5 m height with a source correction of -5.4 dB) • Truck engines (at 1.5 m height with a source correction of -2.4 dB) • Truck exhausts (at 3.6 m height with a source correction of -8.5 dB).
Road pavement surface corrections	The existing road surface is chip seal. The proposed future road surface includes a section of around 230 m of Dense Graded Asphalt (DGA) which extends either side of the project bridge. The correction factors used in the modelling are: • Chip Seal +2.5 dB for cars and + 0 dB for trucks[1] • DGA +0 dB
Ground absorption	Noise levels at receivers can be influenced by the type of ground between the source of noise and the receiver. A ground absorption factor of 50% for residential areas in Wallendbeen and 75% for open grass areas, as detailed in Transport's *Road Noise Validation Guideline* (RNMVG).
General corrections	The model also includes the following corrections to convert the noise model outputs to the appropriate assessment noise levels: • Facade reflections +2.5 dB • L_{A10} to L_{Aeq} -3 dB.
Noise Contour Map Settings	Grid spacing = 20 m Height above ground = 1.5 m All noise contour maps are free field.

Note 1: Chip seal correction is based on literature review which indicates noise from cars is louder than DGA, whereas noise from trucks is approximately the same (*Surface dressing - Noise measurements* (Danish Road Directorate, 2008), *Interim Traffic Noise Policy - Appendix B: Noise Prediction Models* (RTA, 1992)).

4.5.5 Noise Model Validation

To validate the operational road traffic noise model the 2024 existing scenario was modelled using measured traffic data and compared to existing noise measurements in the study area (see **Section 2.0**).

The validation measurement sites are shown in **Figure 1** and a summary of the model validation is provided in **Table 21**.

Only daytime noise monitoring was used for model validation purposes, since the night-time traffic was infrequent to the extent that it did not control the noise environment at the monitoring locations. The validation model also includes the temporary speed restrictions to manage single lane traffic over the temporary bridge which were in place at the time of monitoring.

Table 21 Comparison of Measured and Predicted Road Traffic Noise Levels

Location	Daytime $L_{Aeq(15hour)}$ Noise Level (dBA)		
	Measured[1]	Predicted	Difference[2]
L01	47.3	47.8	0.5
L02	47.6	47.2	-0.4
		Median	0.1

Note 1: Validation of the noise model was completed using data from 9 to 21 November 2024, excluding the daytime period of 16 November and the night-time period of 17 November due to adverse weather.

Note 2: Difference is Predicted minus Measured. A negative difference indicates the predicted level of road traffic noise is lower than the measured data, a positive difference indicates the predicted level is higher.

The Transport *Road Noise Model Validation Guideline* notes that noise models typically result in random scatter error of ±2.0 dB.

Both model validation locations are within the expected model accuracy. The predictions show that the noise model is within the accepted tolerances and is valid for predicting road traffic noise levels for the project.

4.5.6 Noise Mitigation

The *Road Noise Mitigation Guideline* (RNMG) provides guidance in managing and controlling road traffic noise and describes the principles to be applied when reviewing noise mitigation. The RNMG recognises that the RNCG criteria are not always practicable and that it is not always feasible or reasonable to expect that they are achieved.

As projects progress through the early design stages, various road design features are evaluated to assist with minimising road traffic noise. The RNMG defines these ‘integrated noise reduction measures’ as including:

- Adjustments to vertical and horizontal alignments
- Road gradient modifications
- Traffic management
- Cost effective use of won project spoil to provide landscape mounds where there is suitable site footprint.

Following use of the above measures, site specific 'additional noise mitigation measures' are then required to be investigated for receivers which have residual exceedances of the criteria. When evaluating if a receiver qualifies for consideration of 'additional noise mitigation measures' the RNMG considers how far above the criterion the noise level is and also how much a project increases noise levels. These considerations provide a feasible and reasonable approach to identifying qualifying receivers.

The RNMG provides three triggers where a receiver may qualify for consideration of 'additional noise mitigation' (beyond the use of 'integrated noise reduction measures'). These are:

- **Trigger 1** – the predicted 'Build' noise level exceeds the RNCG controlling criterion and the noise level increase due to the project (ie the noise predictions for the 'Build' minus the 'No Build') is greater than 2.0 dB
- **Trigger 2** – the predicted 'Build' noise level is 5 dB or more above the RNCG controlling criterion (ie exceeds the cumulative limit) and the receiver is significantly influenced by project road noise, regardless of the incremental impact of the project
- **Trigger 3** – the noise level contribution from the road project is acute (daytime $L_{Aeq(15hour)}$ 65 dBA or higher, or night-time $L_{Aeq(9hour)}$ 60 dBA or higher) even if noise levels are controlled by a non-project road.

The eligibility of receivers for consideration of 'additional noise mitigation' is determined before the benefit of low noise pavement and noise barriers are included. The requirement for the project is to provide feasible and reasonable additional mitigation to eligible receivers with the aim of meeting the RNCG controlling criterion.

For receivers that qualify for consideration of 'additional noise mitigation', potential noise mitigation measures are to be considered in the following order of preference:

- At-source mitigation:
  - Quieter road pavement surfaces
- In-corridor mitigation:
  - Noise mounds
  - Noise barriers
- At-receiver mitigation:
  - At-property treatments.

4.5.7 Maximum Noise Levels

Maximum noise levels near roads are generally controlled by noise from trucks. Where roads are located close to residential receivers there is potential for sleep disturbance impacts from maximum noise level events.

The RNP and RNCG both state that while a maximum noise level assessment is required to be undertaken for new and redeveloped road infrastructure projects, it should only be used as a tool to help prioritise and rank mitigation strategies and should not be applied as a decisive criterion.

The purpose of a maximum noise level assessment is to determine where maximum noise levels are likely to change as a result of a project.

The maximum noise level assessment includes an evaluation of the number and distribution of night-time events in accordance with the RNCG. A maximum noise level event is defined as being any passby where:

- The maximum noise level of the event is greater than 65 dBA L_{AFmax}

  and

- The $L_{AFmax} – L_{Aeq(1hour)}$ is greater than or equal to 15 dB.

Existing maximum noise levels were monitored in the study area during the unattended noise monitoring survey (see **Section 2.0**). The potential for changes in maximum noise levels to nearby sensitive receivers are then evaluated where appropriate.

5.0 Assessment of Construction Impacts

5.1 Construction Noise Impacts

The following overview is generally representative of the worst-case situation where construction equipment is at the closest point to each receiver. For most work, the construction noise impacts would frequently be lower than predicted as the worst-case situation at a particular receiver is typically only apparent when noisy equipment is in use nearby.

The following assessment shows the predicted noise impacts based on the exceedance of the NML, as per the categories in **Table 22** which are taken from the CNVG-R.

Table 22 NML Exceedance Bands and Corresponding CNVG-R Perception Categories

CNVG-R Perception Category	NML Exceedance	
	Daytime – Standard Construction Hours	Out of Hours Periods
Noticeable	-[1]	1 to 5 dB
Clearly Audible	1 to 10 dB	6 to 15 dB
Moderately Intrusive	11 dB to 20 dB	16 dB to 25 dB
Highly Intrusive	>20 dB	>25 dB

Note 1: Applicable for construction noise levels of 5-10 dB above RBL (see **Table 30**).

A summary of the predicted construction noise impacts for residential receivers is shown in **Table 23**. A summary of the predicted construction noise impacts in for 'other sensitive' receivers is presented in **Table 24**. No commercial buildings are predicted to exceed the NML.

Noise impact maps for all construction scenarios and work periods are included in **Appendix C**.

Table 23 Predicted Construction Noise Exceedances – Residential Receivers

ID	Scenario	Total	HNA[1]	Number of Receiver Buildings With NML Exceedance[2]															
				Standard Daytime			Out of Hours Works												Sleep Disturbance
							Daytime OOH				Evening				Night-time				
				1-10 dB	11-20 dB	>20 dB	1-5 dB	6-15 dB	16-25 dB	>25 dB	1-5 dB	6-15 dB	16-25 dB	>25 dB	1-5 dB	6-15 dB	16-25 dB	>25 dB	> Screening Level
W.01	Site Establishment and Early Work - Typical	93	-	33	18	2	19	33	18	2	22	36	20	8	14	39	23	10	46
W.02	Site Establishment and Early Work - Peak	93	2	43	26	13	5	43	26	13	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
W.03	Earthwork and Drainage - Typical	93	-	25	11	2	19	25	11	2	20	33	17	3	25	31	21	5	32
W.04	Earthwork and Drainage - Peak	93	-	31	21	5	25	31	21	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
W.05	Road Work - Typical	93	-	33	18	2	20	33	18	2	22	37	22	6	14	38	26	9	37
W.06	Road Work - Peak	93	1	38	26	9	14	38	26	9	4	37	35	15	4	34	33	20	56
W.07	Landscaping and Finishing Work - Typical	93	-	33	18	2	19	33	18	2	22	36	20	8	14	39	23	10	33
W.08	Landscaping and Finishing Work - Peak	93	1	37	20	9	20	37	20	9	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
W.09	Compounds and Stockpiles - Typical	93	-	37	28	3	8	37	28	3	17	29	35	6	11	30	33	13	54
W.10	Compounds - Peak	93	-	42	11	-	26	42	11	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Key to Impacts	Noticeable	Clearly Audible	Moderately Intrusive	Highly Intrusive

Note 1: Highly noise affected, based on ICNG definition (i.e. predicted $L_{Aeq(15minute)}$ noise at residential receiver is 75 dBA or greater).

Note 2: Based on worst-case predicted noise levels.

Table 24 Predicted Construction Noise Exceedances – 'Other Sensitive' Receivers

ID	Scenario	Number of Receiver Buildings / Areas with NML Exceedance[1]					
		Educational			Outdoor Active		
		1-10 dB	11-20 dB	>20 dB	1-10 dB	11-20 dB	>20 dB
W.01	Site Establishment and Early Work - Typical	-	-	-	-	-	-
W.02	Site Establishment and Early Work - Peak	2	-	-	2	-	-
W.03	Earthwork and Drainage - Typical	-	-	-	-	-	-
W.04	Earthwork and Drainage - Peak	-	-	-	-	-	-
W.05	Road Work - Typical	-	-	-	-	-	-
W.06	Road Work - Peak	-	-	-	2	-	-
W.07	Landscaping and Finishing Work - Typical	-	-	-	-	-	-
W.08	Landscaping and Finishing Work - Peak	-	-	-	1	-	-
W.09	Compounds and Stockpiles - Typical	-	-	-	-	-	-
W.10	Compounds - Peak	-	-	-	-	-	-

Key to Impacts	Clearly Audible	Moderately Intrusive	Highly Intrusive

Note 1: Based on worst-case predicted noise levels.

The above assessment shows that:

- The work is generally close to residential receivers with low background noise levels and associated noise management levels. All construction scenarios are predicted exceed the management levels, with impacts up to 'highly intrusive' at the closest receivers.
- Noise impacts are predicted to be more widespread during 'peak' scenarios when the most noise intensive equipment is in use. During 'typical' work the number and magnitude of the impacts reduces accordingly.
- 'Clearly audible' impacts are predicted at two buildings at Wallendbeen Public School during *Site Establishment and Early Work – Peak.*
- 'Clearly audible' impacts are predicted at two nearby horse arenas during *Site Establishment and Early Work – Peak* and *Road Work - Peak*. Clearly audible' impacts are predicted at one of the nearby horse arenas during *Landscaping and Finishing Work – Peak*.

5.1.1 Daytime Scenarios

The highest daytime construction noise impacts are predicted during *Site Establishment and Early Work* when noise intensive equipment such as chainsaws are in use. The predicted range of daytime noise impacts during this work are shown in:

- **Figure 5** – *W.01 – Site Establishment and Early Work - Typical* when the most noise intensive equipment is not in use.
- **Figure 6** – *W.02 – Site Establishment and Early Work – Peak*, when noise intensive equipment is in use.

It is noted that the figures show the impacts assuming work is being completed in all locations at the same time. In reality, for most scenarios, work would occur in one area before moving to the next location which would limit the impacts to the surrounding receivers.

Noise impact maps for all construction scenarios and work periods are included in **Appendix C**.

Figure 5 Predicted Impacts during *W.01 – Site Establishment and Early Work - Typical* (Daytime)

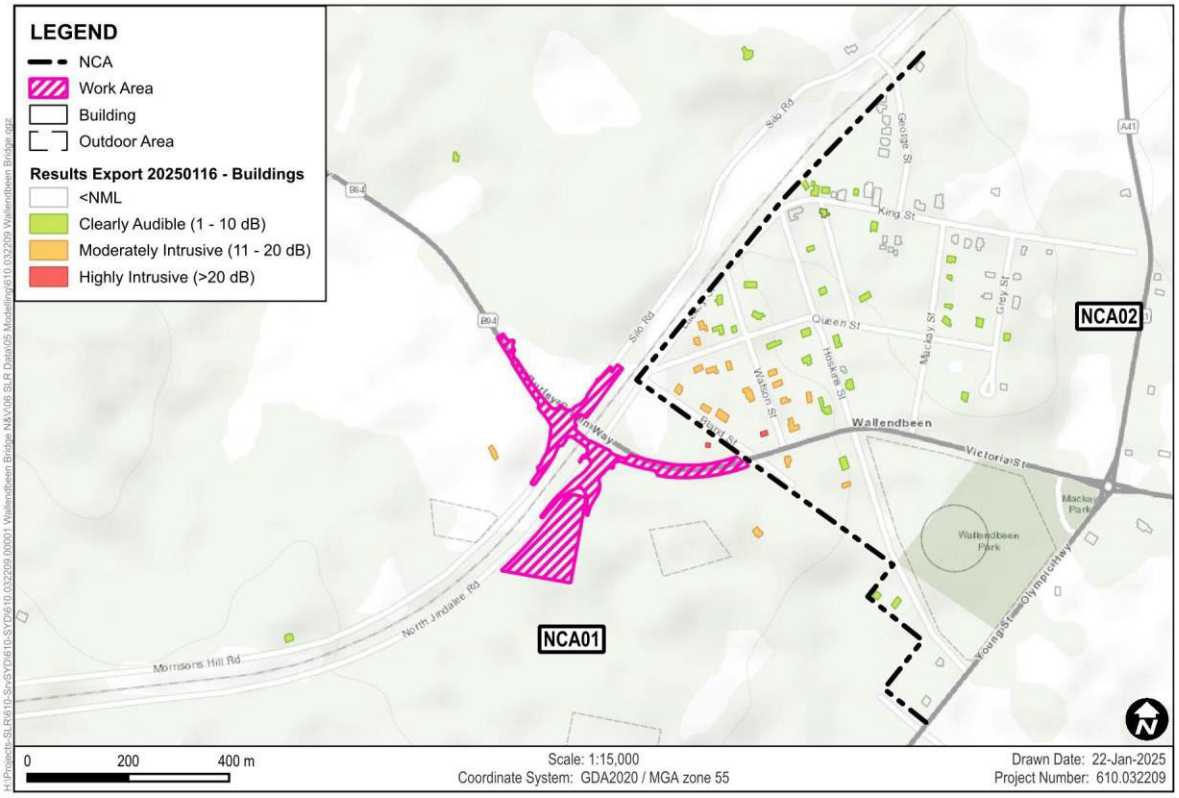
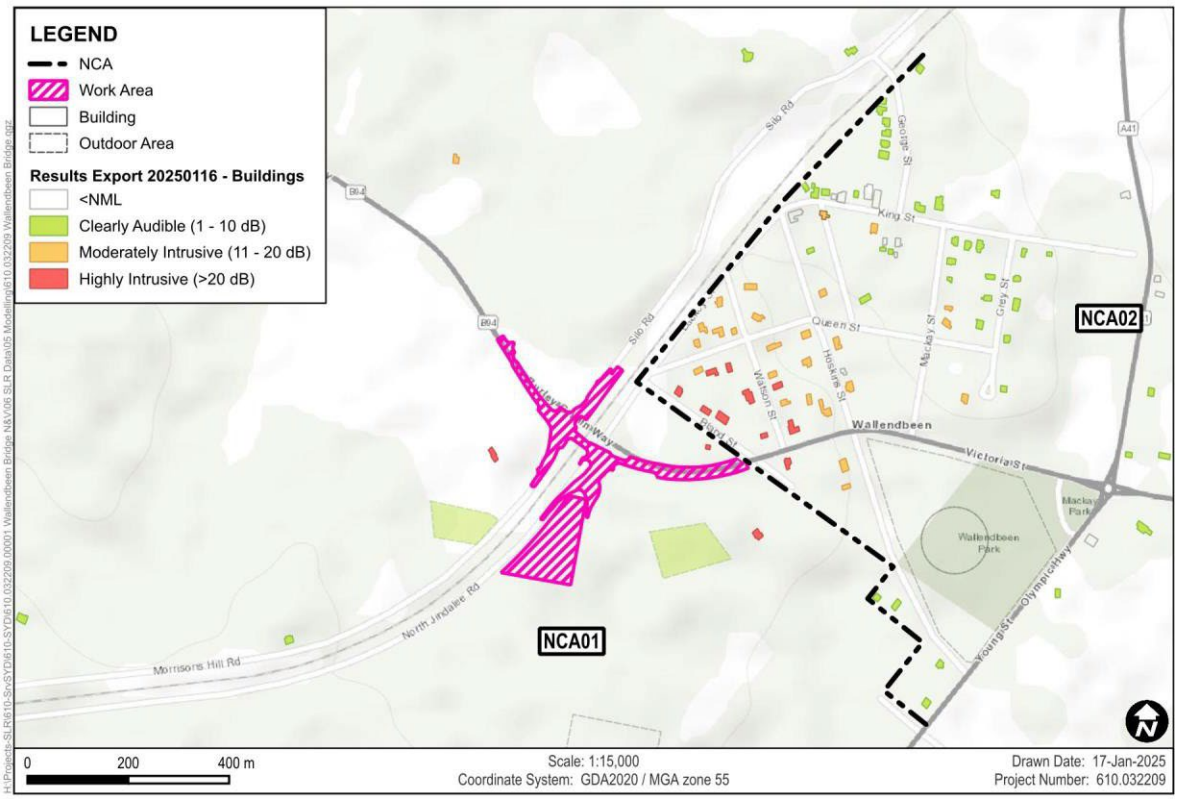


Figure 6 Predicted Impacts during *W.02 – Site Establishment and Early Work - Peak* (Daytime)



The above figures show that during 'typical' work two front row receivers are predicted to have 'highly intrusive' worst-case daytime impacts, with 'moderately intrusive' and 'clearly audible' impacts at more distant receivers. During 'peak' work, 'highly intrusive' impacts are a total of 13 predicted at receivers which are set further back from the work.

5.1.2 Night-time Scenarios

Certain construction activities that may result in traffic restrictions are likely to be carried out during the night-time to minimise disruption to traffic and provide a safer working environment for construction workers.

The highest night-time construction noise impacts are predicted during *Road Work* when noise intensive paving equipment is in use. The predicted range of night-time impacts during this work are shown in:

- **Figure 7** – *W.05–Road Works – Typical,* when the most noise intensive equipment is not in use.
- **Figure 8** – '*W.06–Road Works – Peak*, when noise intensive equipment is in use.

It is noted that the figures show the impacts assuming work is being completed in all locations at the same time. In reality, for most scenarios, work would occur in one area before moving to the next location which would limit the impacts to the surrounding receivers.

Noise impact maps for all construction scenarios and work periods are included in **Appendix C**.

Figure 7 Predicted Impacts during *W.05 – Road Work – Typical* (Night)

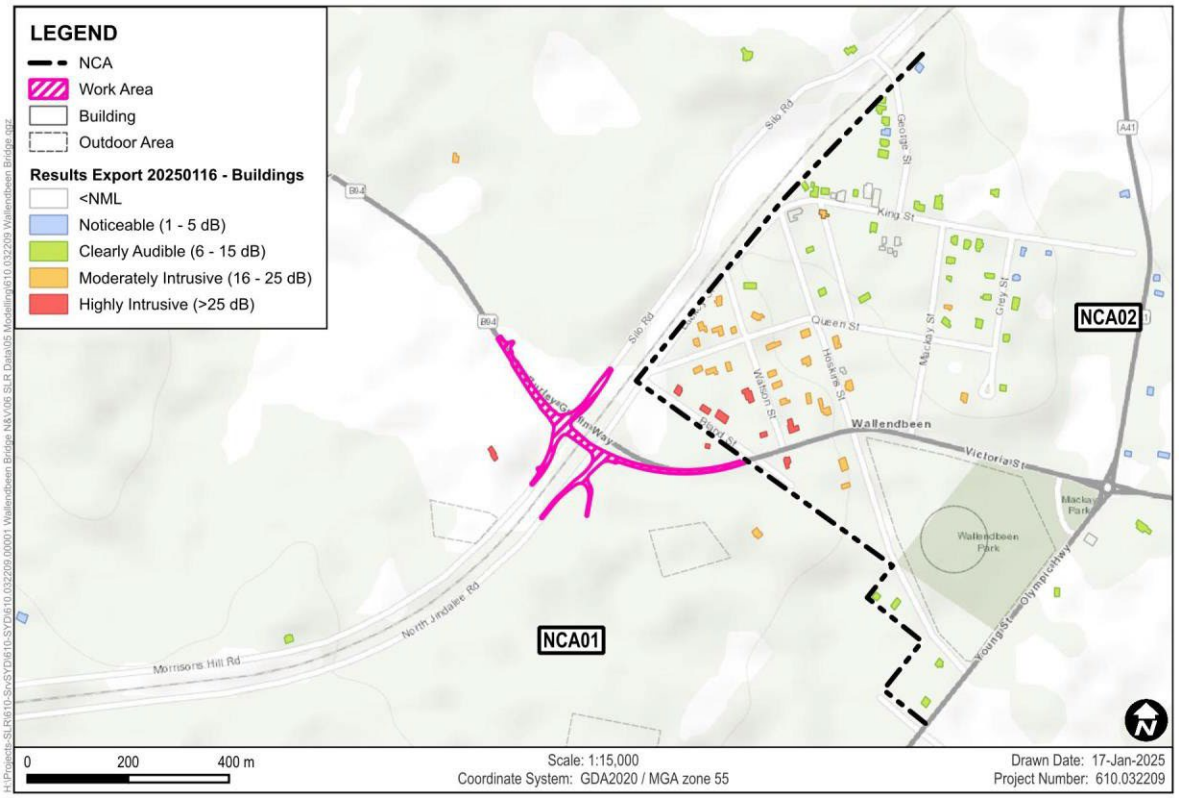
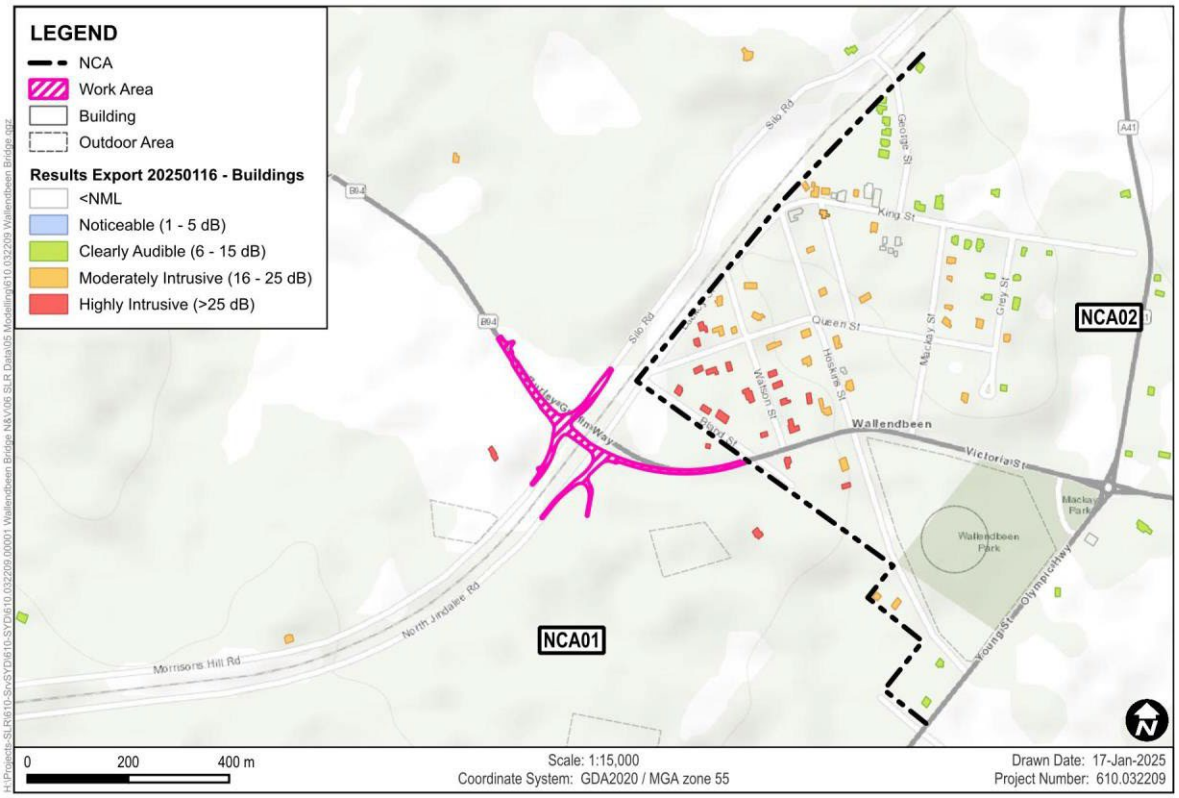


Figure 8 Predicted Impacts during *W.06 – Road Works – Peak* (Night)



The above figures show that the predicted high magnitude (ie 'moderately intrusive' and 'highly intrusive') noise impacts during night-time work are more widespread than the daytime scenarios, which is due to lower NMLs during this period.

Residential receivers near to the work are predicted to have 'highly intrusive' worst-case

The requirements for night-time work would be confirmed as the project progresses. Construction mitigation and management measures are discussed further in **Section 7.1**.

5.2 Highly Noise Affected Residential Receivers

Residential receivers that are subject to noise levels of 75 dBA or greater are considered Highly Noise Affected by the ICNG. Receivers can be Highly Noise Affected when noisy work occurs close to residents.

The number of residential receivers which could potentially be Highly Noise Affected during the worst-case impacts from the project are summarised in **Table 25** and shown in **Figure 9**.

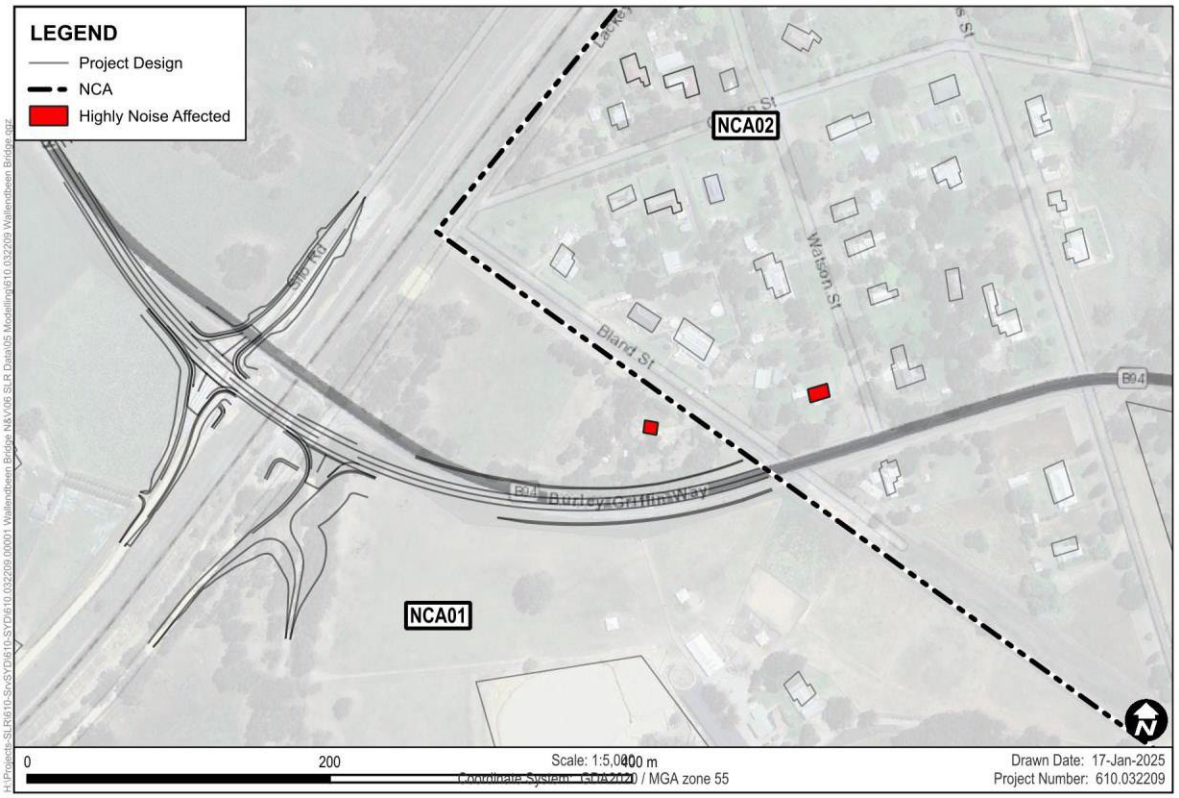
The predictions assume the individual scenarios are occurring at all locations across the study area.

Table 25 Predicted Number of Highly Noise Affected Residential Receivers

ID	Scenario	NCA01	NCA02
W.01	Site Establishment and Early Work - Typical		
W.02	Site Establishment and Early Work - Peak	1	1
W.03	Earthwork and Drainage - Typical		
W.04	Earthwork and Drainage - Peak		
W.05	Road Work - Typical		
W.06	Road Work - Peak	1	
W.07	Landscaping and Finishing Work - Typical		
W.08	Landscaping and Finishing Work - Peak	1	
W.09	Compounds and Stockpiles - Typical		
W.10	Compounds - Peak		

The assessment shows that the two nearest residential receivers are predicted to be Highly Noise Affected when noise intensive work is being carried out nearby. The highest noise levels would only likely be apparent for relatively short periods. When work is being completed in other more distant parts of the study area (ie further from an induvial receiver), the noise levels would be correspondingly lower.

Figure 9 Highly Noise Affected Residential Receivers (from any works scenario)



5.3 Sleep Disturbance

A sleep disturbance screening assessment has been undertaken for the construction work and is included in **Table 23**.

The assessment shows that the sleep disturbance screening level is likely to be exceeded when night work occurs near residential receivers. The receivers which would potentially be affected by sleep disturbance impacts are generally the same receivers where 'moderately intrusive' and 'highly intrusive' night-time impacts have been predicted (see **Appendix C** for all construction noise impact figures).

Note that although all 'typical' work scenarios have been assessed in the night-time period, this generally represents the potential for work between 7am and 8am on Sundays. The potential for sleep disturbance impacts during this period is considered low.

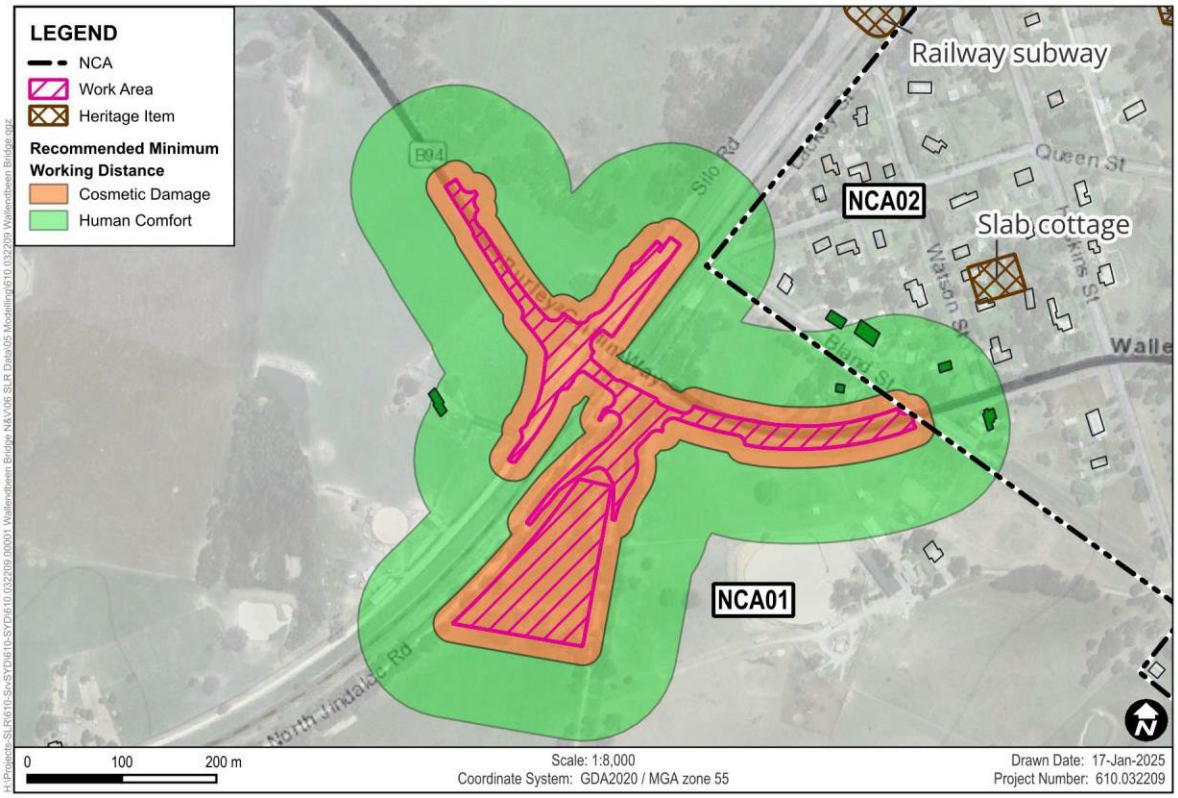
The requirements for night-time work would be confirmed as the project progresses. Construction mitigation and management measures are discussed further in **Section 7.1**.

5.4 Construction Vibration Assessment

Vibration offset distances for the vibration intensive equipment required to complete the work have been determined from the CNVG-R minimum working distances for cosmetic damage and human response (see **Table 12**).

The recommended vibration minimum working distances are shown in **Figure 10** and buildings within the minimum working distances are identified.

Figure 10 Construction Vibration Assessment



Cosmetic Damage Assessment

The assessment shows that all receivers are outside of the recommended minimum working distance for cosmetic damage (ie 20 m for a vibratory roller).

Figure 10 also shows the closest heritage items, which are over 100 m from the work area and are sufficiently distant from vibration intensive work.

Human Comfort Vibration Assessment

The assessment shows that up to six receivers may be within the recommended minimum working distance for human comfort (ie 100 m for a large vibratory roller). It is noted that the assessment conservatively assumes that a large vibratory roller may be required up to the boundary of the work area closest to each receiver.

Occupants of affected buildings may be able to perceive vibration impacts at times when vibration intensive equipment is in use. Where impacts are perceptible, they would likely only be apparent for relatively short durations when vibration intensive equipment is nearby.

Construction mitigation and management measures are discussed further in **Section 7.1**.

5.5 Construction Traffic

Access to the Proposal is available from Cootamundra or Young via the Burley Griffin Way and Olympic Highway as required. Access to the Proposal from Temora and Yass is also available along the Burley Griffin Way.

Construction related traffic has the potential to temporarily increase road traffic noise levels at receivers that are near to haulage routes. Detailed construction traffic planning is not available at the time of this assessment, however, it is conservatively assumed that there would be up to 50 light vehicles and 50 heavy vehicles accessing the site per day, including movements to stockpiles.

Traffic assumptions and the predicted increase in road traffic noise due to construction vehicles is shown in **Table 26**.

Table 26 Construction Traffic Noise

Road	Vehicle movements								Predicted L_{Aeq} Noise Increase, dB	
	Existing				Construction[1]					
	Daytime		Night-time		Daytime		Night-time		Daytime	Night-time
	LV	HV	LV	HV	LV	HV	LV	HV		
Burley Griffin Way	800	327	46	57	25	40	25	10	0.4	0.8
Olympic Highway	1,967	646	166	89	25	40	25	10	0.2	0.5

Note: It is assumed that all construction vehicle movements may use both Olympic Highway and Burley Griffin Way. It is assumed that the half of the construction light vehicle movements occur during the night-time period due to workers potentially arriving before 7am. It is assumed that the majority of construction heavy vehicle movements occur during the daytime period.

The assessment shows that construction traffic is predicted to increase the road traffic noise on Burley Griffin Way and the Olympic Highway by less than 1 dB, therefore, construction traffic noise impacts are not expected. For reference, the RNP states that an increase of up to 2 dB represents a minor impact that is considered barely perceptible to the average person.

Construction heavy vehicles will also likely be required to use local roads to access some stockpile sites. For local roads with low existing traffic, construction heavy vehicles are expected to increase traffic noise by greater than 2 dB and would result in a noticeable change to the local road noise. However, noise from construction vehicles on local roads is generally not expected to exceed the RNP criteria (see **Table 7**), due to the relatively low number of daily movements. For example, a scenario with a residential receiver located around 20 m from the road would require more than 15 construction heavy vehicle movements in one hour to exceed the daytime local road criteria of $L_{Aeq(1hour)}$ 55 dBA.

6.0 Assessment of Operational Impacts

Operational road traffic noise impacts from the project have been predicted for all sensitive receivers in the study area. The operational impacts are discussed in the following sections.

6.1 Residential Receivers

The predicted operational road traffic noise levels at residential receivers are summarised in **Table 27** for the 2025 at opening and 2035 future scenarios. The table shows the worst-case noise levels in each NCA, which are experienced by the receivers nearest to the road.

Table 27 Predicted Road Traffic Noise Levels at Most Affected Residential Receivers in each NCA

NCA	Predicted Noise Level (dBA)[1]								Number of Triggered Buildings[2]			
	At Opening (2028)				Future (2038)							
	No Build (without project)		Build (with project)		No Build (without project)		Build (with project)					
	Day	Night	Day	Night	Day	Night	Day	Night	Trigger 1 >2.0 dB	Trigger 2 Cumulative	Trigger 3 Acute	Total
NCA01	55	49	55	49	56	50	57	50	-	-	-	-
NCA02	64	58	64	58	65	59	65	59	-	-	-	-
											Total	-

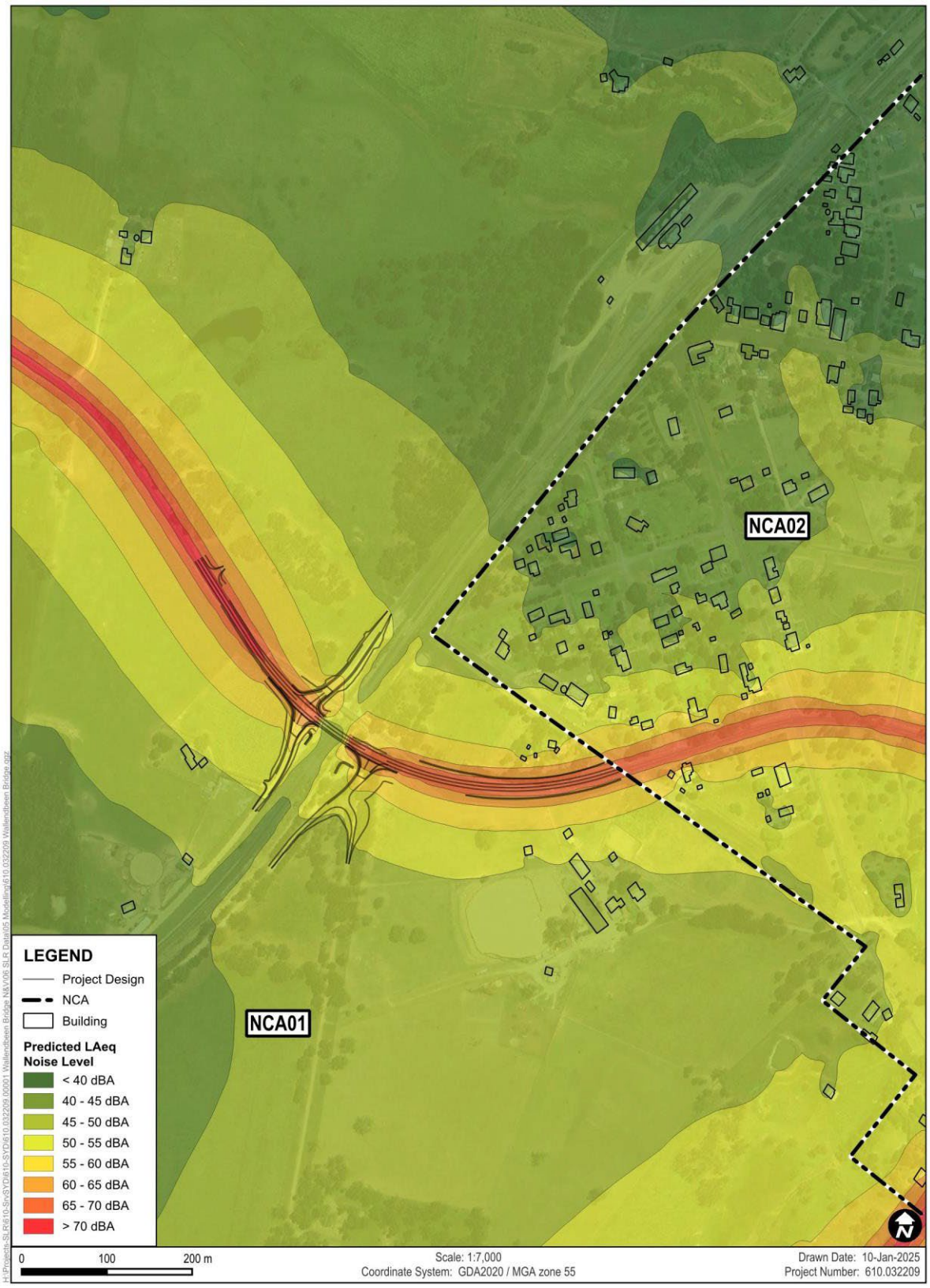
Note 1: Daytime and night-time are $L_{Aeq(15hour)}$ and $L_{Aeq(9hour)}$ noise levels, respectively.

Note 2: the RNMG triggers are discussed in **Section 4.5.6**.

Receivers are generally most affected by the project with respect to the RNCG criteria in the daytime period in 2035. This scenario is considered to control the assessment in terms of determining the worst-case noise levels.

The predicted noise levels for the daytime scenario in 2035 are shown in **Figure 11** and the predicted change in noise levels (Build (with project) minus No Build (without project)) for the same scenario is shown in **Figure 12**.

Figure 11 Predicted Operational Road Traffic Noise Levels with the Project (Daytime Scenario in 2035)



Note 1: The contours are predicted at 1.5 m above ground level and are free-field.

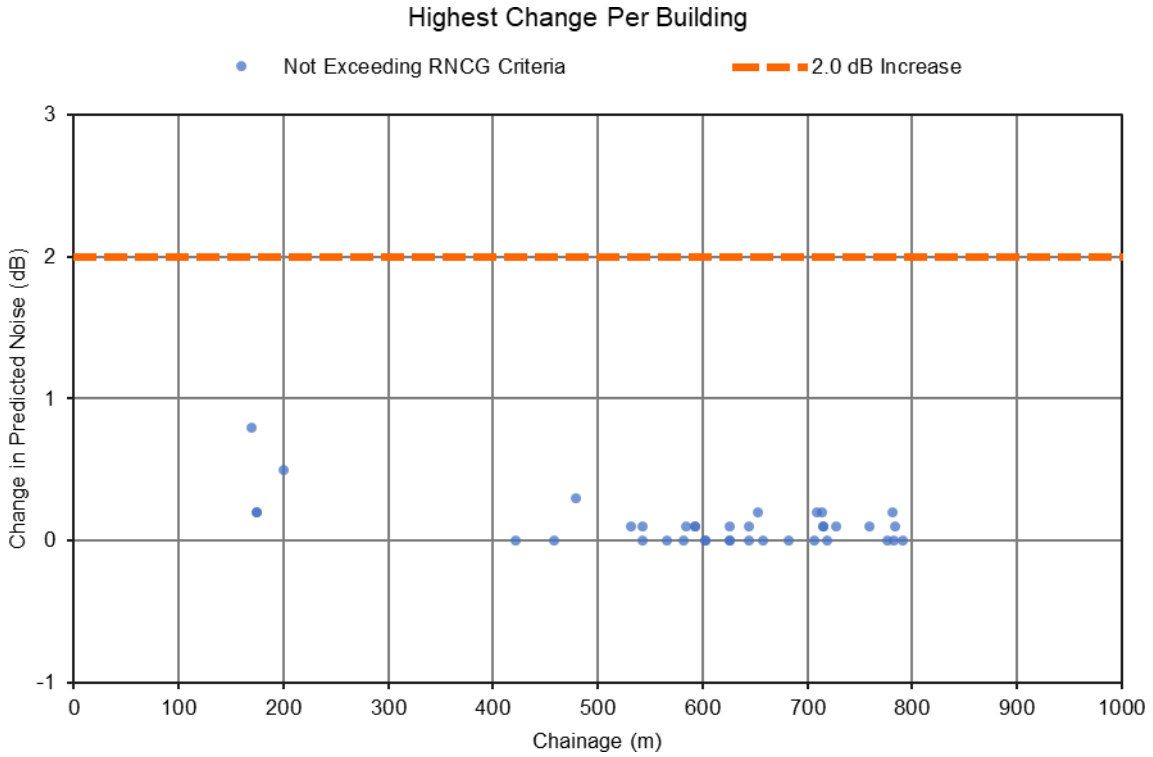
Figure 12 Predicted Change in Operational Road Traffic Noise (Daytime Scenario in 2035)



Note 1: The contours are predicted at 1.5 m above ground level and are free-field.

The predicted highest change in operational noise at individual receivers from all scenarios is also shown in a scatter graph in **Figure 13**.

Figure 13 Predicted Change in Road Traffic Noise levels due to the Project



Note: The change in noise level is the predicted highest value per receiver building from all assessed scenarios. The chainage is approximate, starting around 700 m west of the project bridge and heading east into Wallendbeen.

The results show that:

- The project is not predicted to significantly alter operational road traffic noise levels for the receivers in the study area. The closest receiver in NCA01 is predicted have road traffic noise increase by around 1 dB, with all other receivers predicted to have around 0 dB change. This is due to the project bridge being realigned around 20 m to the southeast, however, the increase in noise is limited due to the project including DGA pavement which is quitter than the existing chip seal surface.
- The receivers closest to the road in NCA02 are predicted to have relatively high road traffic noise levels due their proximity to the existing road (ie up to 65 dB at Victoria Street (Burley Griffin Way) during the daytime in 2035). However, such receivers are beyond the extent of the project and are not predicted to have any increase in noise due to the project.
- No receivers are predicted to exceed the RNCG base criteria and experience a noise increase greater than 2.0 dB.
- No receivers are predicted to exceed the RNMG cumulative or acute noise limits.

6.2 ‘Other Sensitive’ Receivers

No ‘other sensitive’ receivers are predicted to exceed the assessment criteria.

The nearby horse arenas are predicted to experience road traffic noise levels of around 43 - 48 dBA and 44 - 49 dBA in the daytime period of 2025 and 2035, respectively.

6.3 Maximum Road Traffic Noise Levels

6.3.1 Existing Maximum Noise Levels

Existing maximum noise levels were measured in the study area during the noise monitoring survey and a summary of the data is shown in **Table 28**. Detailed results are provided in **Appendix D**.

Table 28 Existing Maximum Noise Level Events

Monitoring Location	Total Night-time Events[1,2]	Measured Maximum Noise Levels (dBA L_{Amax})	
		Range	Median
L01	198	65-80	67
L02	299	65-83	69

Note 1: Maximum noise levels are defined in **Section 4.5.7.**

Note 2: Monitoring period for all locations was 9 November to 22 November 2024.

The above table shows that existing maximum noise level events are a regular feature at the monitoring locations. Maximum noise events were measured to typically range from around 65 to 83 dBA.

Maximum noise level events towards the upper end of the range are likely to be from heavy vehicle, whereas the lower end of the range is likely due to nearby light vehicles.

6.3.2 Future Maximum Noise Levels

As the project would realign Burley Griffin Way, there is potential for changes to maximum noise level events in the study area due to vehicles being closer to adjacent receivers. A summary of the predicted changes is provided in **Table 29**.

Table 29 Predicted Change in Maximum Noise Levels

NCA	Worst-case Change (dB)	Discussion
NCA01	2 dB	Minor increases are predicted due to the bridge and road realignment to the southwest. A notable increase is only predicted at the closest receiver on Morrisons Hill Road.
NCA02	0 dB	Negligible change in maximum noise levels predicted in this NCA.

While receivers are not triggered for consideration of ‘additional noise mitigation’ by maximum noise levels alone, the selection of feasible and reasonable mitigation measures should consider the potential change in maximum noise levels and the effect the potential mitigation would have on those levels.

The frequency of maximum noise level events is also expected to increase proportional to traffic growth in the area. However, the project is not intended to increase the traffic carrying capacity of the road and therefore is not expected to increase the occurrence of maximum noise level events.



7.0 Mitigation

7.1 Construction Impacts

The ICNG acknowledges that due to the nature of construction work it is inevitable that there would be noise and vibration impacts where construction activities are near to sensitive receivers. Examples of potential mitigation and management measures which could be applied to the project to minimise the impacts are provided below.

7.1.1 Standard Mitigation Measures

The Transport *Construction Noise and Vibration Guideline (Roads)* (CNVG-R) contains a number of 'standard mitigation measures' for mitigating and managing construction impacts. The measures are shown in **Appendix C** and should be applied to construction of the project, where feasible and reasonable.

7.1.2 Additional Mitigation Measures

Where noise impacts remain after the use of 'standard mitigation measures', the CNVG-R requires the use of 'additional mitigation measures' where feasible and reasonable. The 'additional mitigation measures' are determined on the basis of the exceedance of the appropriate management levels. Descriptions of the various measures are in **Appendix C**. The CNVG-R defines how 'additional mitigation measures' are applied to airborne noise impacts and the approach is shown in **Table 30**.

Table 30 CNVG-R Triggers for Additional Mitigation Measures – Airborne Noise

Predicted Airborne ($L_{Aeq, 15min}$) Noise Level at Receiver			Additional Mitigation Measures
Perception	**dBA above RBL**	**dBA above NML**	**Type[1]**
All hours			
75 dBA or greater			N, V, PC, RO
Approved Hours: Mon - Fri (7am - 6pm), Sat (8am - 6pm), Sun/Pub Hol (Nil)			
Noticeable	5 to <10	0	-
Clearly Audible	10 to <20	<10	-
Moderately Intrusive	20 to 30	10 to 20	N, V
Highly Intrusive	> 30	> 20	N, V
OOHW Period 1: Mon - Fri (6pm - 10pm), Sat (7am - 8am and 6pm - 10pm), Sun/Pub Hol (8am - 6pm)			
Noticeable	5 to <10	< 5	-
Clearly Audible	10 to <20	5 to <15	N, R1, DR
Moderately Intrusive	20 to 30	15 to 25	V, N, R1, DR
Highly Intrusive	> 30	> 25	V, IB, N, R1, DR, PC, SN

Predicted Airborne ($L_{Aeq, 15min}$) Noise Level at Receiver			Additional Mitigation Measures
OOHW Period 2: Mon - Fri (10pm - 7am), Sat (10pm - 8am), Sun/Pub Hol (6pm - 7am)			
Noticeable	5 to <10	< 5	N
Clearly Audible	10 to <20	5 to <15	V, N, R2, DR
Moderately Intrusive	20 to 30	15 to 25	V, IB, N, PC, SN, R2, DR
Highly Intrusive	> 30	> 25	AA, V, IB, N, PC, SN, R2, DR

Note 1: N = Notification, SN = Specific Notification, PC = Phone Calls, IB = Individual Briefings, R1 = Respite Period 1, R2 = Respite Period 2, RO = Project Specific Respite Offer, DR = Duration Respite, AA = Alternative Accommodation, V = Verification.

The noise impact assessment summarised in **Table 23** and the noise impact maps in **Appendix C** show predicted noise impacts in the categories corresponding to the 'additional mitigation measures'.

The requirement for 'additional mitigation measures' should be further evaluated as the project progresses and detailed construction scheduling information becomes available.

7.1.3 Project Specific Mitigation Measures

On the basis of the predictions, **Table 31** lists the proposal specific mitigation measures which would be used to minimise the impacts.

Table 31 Recommended Project Specific Noise Mitigation Measures

Item	Detail
Construction hours and scheduling	Where noise intensive equipment is to be used near sensitive receivers, the work should be scheduled for Standard Construction Hours, where possible. If it is not possible to restrict the work to the daytime then they should be completed as early as possible in each work shift. Appropriate respite should also be provided to affected receivers in accordance with the CNVG-R.
Compounds with long term work	Hoarding, or other shielding structures (site shed, earth bund, etc), should be considered near compounds or fixed work areas with long durations where practicable. To provide effective noise mitigation, the shielding structure should break line-of-sight from the nearest receivers to the work and be of solid construction with minimal gaps.
Construction traffic	Limit the use of engine compression brakes in residential areas, particular at night. Ensure vehicles are fitted with a maintained Original Equipment Manufacturer exhaust silencer or a silencer that complies with the National Transport Commission's 'In-service test procedure' and standard. Consider the use of non-tonal reverse beepers and ambient sensitive alarms (that adjust noise output relative to the ambient level) where practicable.

7.2 Operational Road Traffic Noise Mitigation Measures

Road traffic noise levels from infrastructure projects should be reduced, where feasible and reasonable, to meet the RNCG noise criteria using mitigation.

The assessment in **Section 6.0** shows that the surrounding receivers are predicted to comply with the noise criteria.

8.0 Conclusion

Transport is currently constructing a new bridge over the Main Southern Railway line on the Burley Griffin Way at Wallendbeen.

This report describes the existing noise environment in the study area, outlines the method used in the assessment and identifies the likely impacts from construction and operation of the project on the nearby sensitive receivers. Where impacts are predicted, appropriate measures have been recommended to mitigate and manage the impacts.

Construction Noise and Vibration

The nearest residential receivers to the project are predicted to experience 'highly intrusive' worst-case noise impacts at certain times, particularly when noise intensive equipment is in use near to receivers. These worst-case impacts are, however, generally limited to a relatively small number of the nearest residential receivers. Residential receivers which are further back are also predicted to be impacted by the project during noisy construction work, but to a lesser degree.

Work may be required to occur outside Standard Construction Hours. The noise impacts during potential evening and night-time work are predicted to be increased compared to daytime work due to more stringent criteria.

The main potential source of vibration during construction of the project would be from vibratory rollers. The nearest receivers to the project are likely to be within the minimum working distance for human comfort, meaning that vibration may be perceptible at times.

The project should apply all feasible and reasonable work practices to reduce the potential noise and vibration impacts and a number of strategies have been recommended.

Operational Road Traffic Noise

The project realigns and raises Burley Griffin way around the new bridge. Operational road traffic noise levels are predicted to increase in the area within around 100 m to the southwest of the new bridge due to the realignment. The increase is, however, minimised due to the project including a section of DGA pavement which is quieter relative to the existing chip seal surface.

No receivers are predicted to trigger for consideration of additional mitigation based on the NSW Road Noise Policy and the relevant Transport guidelines.



Appendix A Acoustic Terminology

Corridor Realignment and Replacement Bridge Over Rail at Wallendbeen

Noise and Vibration Impact Assessment

Transport for NSW

SLR Project No.: 610.032209.00001

30 January 2025

1. Sound Level or Noise Level

The terms 'sound' and 'noise' are almost interchangeable, except that 'noise' often refers to unwanted sound.

Sound (or noise) consists of minute fluctuations in atmospheric pressure. The human ear responds to changes in sound pressure over a very wide range with the loudest sound pressure to which the human ear can respond being ten million times greater than the softest. The decibel (abbreviated as dB) scale reduces this ratio to a more manageable size by the use of logarithms.

The symbols SPL, L or LP are commonly used to represent Sound Pressure Level. The symbol LA represents A-weighted Sound Pressure Level. The standard reference unit for Sound Pressure Levels expressed in decibels is 2 x 10^{-5} Pa.

2. 'A' Weighted Sound Pressure Level

The overall level of a sound is usually expressed in terms of dBA, which is measured using a sound level meter with an 'A-weighting' filter. This is an electronic filter having a frequency response corresponding approximately to that of human hearing.

People's hearing is most sensitive to sounds at mid frequencies (500 Hz to 4,000 Hz), and less sensitive at lower and higher frequencies. Different sources having the same dBA level generally sound about equally loud.

A change of 1 dB or 2 dB in the level of a sound is difficult for most people to detect, whilst a 3 dB to 5 dB change corresponds to a small but noticeable change in loudness. A 10 dB change corresponds to an approximate doubling or halving in loudness. The table below lists examples of typical noise levels.

Sound Pressure Level (dBA)	Typical Source	Subjective Evaluation
130	Threshold of pain	Intolerable
120	Heavy rock concert	Extremely noisy
110	Grinding on steel	
100	Loud car horn at 3 m	Very noisy
90	Construction site with pneumatic hammering	
80	Kerbside of busy street	Loud
70	Loud radio or television	
60	Department store	Moderate to quiet
50	General Office	
40	Inside private office	Quiet to very quiet
30	Inside bedroom	
20	Recording studio	Almost silent

Other weightings (eg B, C and D) are less commonly used than A-weighting. Sound Levels measured without any weighting are referred to as 'linear', and the units are expressed as dB(lin) or dB.

3. Sound Power Level

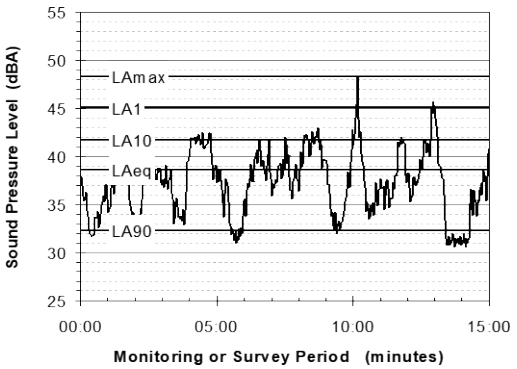
The Sound Power of a source is the rate at which it emits acoustic energy. As with Sound Pressure Levels, Sound Power Levels are expressed in decibel units (dB or dBA), but may be identified by the symbols SWL or LW, or by the reference unit 10^{-12} W.

The relationship between Sound Power and Sound Pressure is similar to the effect of an electric radiator, which is characterised by a power rating but has an effect on the surrounding environment that can be measured in terms of a different parameter, temperature.

4. Statistical Noise Levels

Sounds that vary in level over time, such as road traffic noise and most community noise, are commonly described in terms of the statistical exceedance levels LAN, where LAN is the A-weighted sound pressure level exceeded for N% of a given measurement period. For example, the LA1 is the noise level exceeded for 1% of the time, LA10 the noise exceeded for 10% of the time, and so on.

The following figure presents a hypothetical 15 minute noise survey, illustrating various common statistical indices of interest.



Of particular relevance, are:

LA1 The noise level exceeded for 1% of the 15 minute interval.

LA10 The noise level exceeded for 10% of the 15 minute interval. This is commonly referred to as the average maximum noise level.

LA90 The noise level exceeded for 90% of the sample period. This noise level is described as the average minimum background sound level (in the absence of the source under consideration), or simply the background level.

LAeq The A-weighted equivalent noise level (basically, the average noise level). It is defined as the steady sound level that contains the same amount of acoustical energy as the corresponding time-varying sound.

5. Frequency Analysis

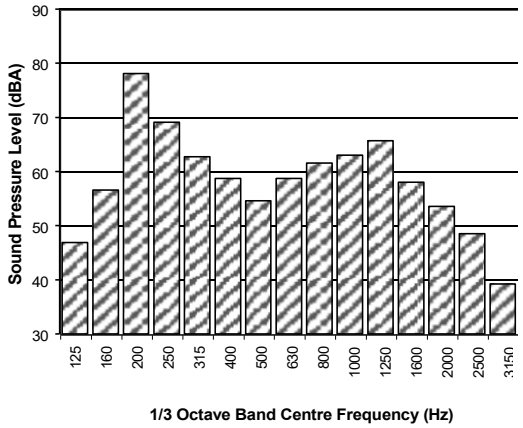
Frequency analysis is the process used to examine the tones (or frequency components) which make up the overall noise or vibration signal.

The units for frequency are Hertz (Hz), which represent the number of cycles per second.

Frequency analysis can be in:

- Octave bands (where the centre frequency and width of each band is double the previous band)
- 1/3 octave bands (three bands in each octave band)
- Narrow band (where the spectrum is divided into 400 or more bands of equal width)

The following figure shows a 1/3 octave band frequency analysis where the noise is dominated by the 200 Hz band. Note that the indicated level of each individual band is less than the overall level, which is the logarithmic sum of the bands.



6. Annoying Noise (Special Audible Characteristics)

A louder noise will generally be more annoying to nearby receivers than a quieter one. However, noise is often also found to be more annoying and result in larger impacts where the following characteristics are apparent:

- **Tonality** - tonal noise contains one or more prominent tones (ie differences in distinct frequency components between adjoining octave or 1/3 octave bands), and is normally regarded as more annoying than 'broad band' noise.
- **Impulsiveness** - an impulsive noise is characterised by one or more short sharp peaks in the time domain, such as occurs during hammering.
- **Intermittency** - intermittent noise varies in level with the change in level being clearly audible. An example would include mechanical plant cycling on and off.
- **Low Frequency Noise** - low frequency noise contains significant energy in the lower frequency bands, which are typically taken to be in the 10 to 160 Hz region.

7. Vibration

Vibration may be defined as cyclic or transient motion. This motion can be measured in terms of its displacement, velocity or acceleration. Most assessments of human response to vibration or the risk of damage to buildings use measurements of vibration velocity. These may be expressed in terms of 'peak' velocity or 'rms' velocity.

The former is the maximum instantaneous velocity, without any averaging, and is sometimes referred to as 'peak particle velocity', or PPV. The latter incorporates 'root mean squared' averaging over some defined time period.

Vibration measurements may be carried out in a single axis or alternatively as triaxial measurements (ie vertical, longitudinal and transverse).

The common units for velocity are millimetres per second (mm/s). As with noise, decibel units can also be used, in which case the reference level should always be stated. A vibration level V, expressed in mm/s can be converted to decibels by the formula 20 log (V/Vo), where Vo is the reference level (10^{-9} m/s). Care is required in this regard, as other reference levels may be used.

8. Human Perception of Vibration

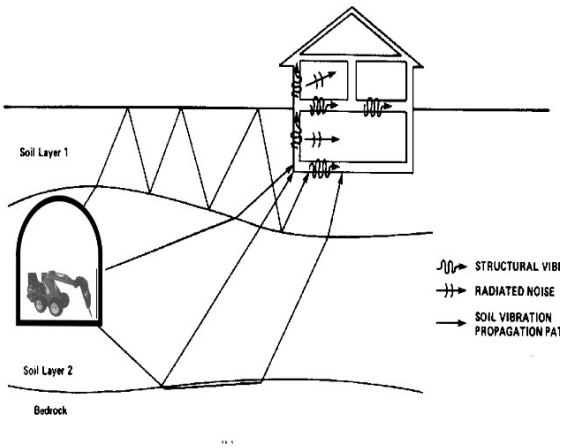
People are able to 'feel' vibration at levels lower than those required to cause even superficial damage to the most susceptible classes of building (even though they may not be disturbed by the motion). An individual's perception of motion or response to vibration depends very strongly on previous experience and expectations, and on other connotations associated with the perceived source of the vibration. For example, the vibration that a person responds to as 'normal' in a car, bus or train is considerably higher than what is perceived as 'normal' in a shop, office or dwelling.

9. Ground-borne Noise, Structure-borne Noise and Regenerated Noise

Noise that propagates through a structure as vibration and is radiated by vibrating wall and floor surfaces is termed 'structure-borne noise', 'ground-borne noise' or 'regenerated noise'. This noise originates as vibration and propagates between the source and receiver through the ground and/or building structural elements, rather than through the air.

Typical sources of ground-borne or structure-borne noise include tunnelling works, underground railways, excavation plant (eg rockbreakers), and building services plant (eg fans, compressors and generators).

The following figure presents an example of the various paths by which vibration and ground-borne noise may be transmitted between a source and receiver for construction activities occurring within a tunnel.



The term 'regenerated noise' is also used in other instances where energy is converted to noise away from the primary source. One example would be a fan blowing air through a discharge grill. The fan is the energy source and primary noise source. Additional noise may be created by the aerodynamic effect of the discharge grill in the airstream. This secondary noise is referred to as regenerated noise.

Appendix B Ambient Noise Monitoring Results

Corridor Realignment and Replacement Bridge Over Rail at Wallendbeen

Noise and Vibration Impact Assessment

Transport for NSW

SLR Project No.: 610.032209.00001

30 January 2025

Noise Monitoring Location	L.01
Noise Monitoring Address	**42 Morrisons Hill Road, Wallendbeen**

Logger Device Type: B&K 2250, Logger Serial No: 3011830
Sound Level Meter Device Type: B&K 2250L, Sound Level Meter Serial No: 3004635

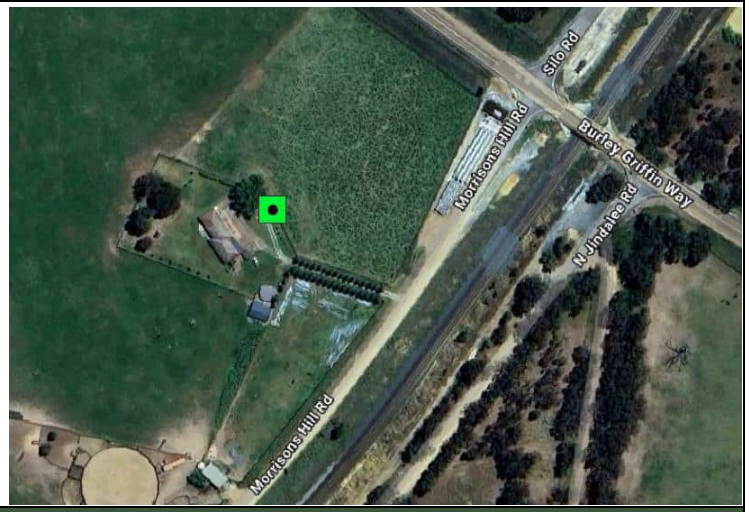
Ambient noise logger deployed at 42 Morrisons Hill Road, Wallendbeen. Logger located on fence line of house yard with view to Burley Griffin Way around 125 m to the north.

Attended noise measurements indicate road traffic noise and rail noise contribute to the ambient noise environment at this location. Natural noise sources such as birds and wind also contribute to the ambient noise environment.

Recorded Noise Levels (LAmax) 8/11/2024:

Wind – 54 to 56 dBA
Aircraft – 48 to 49 dBA
Birds – 49 to 50 dBA
Truck – 47 to 53 dBA
Train – 58 dBA

Map of Noise Monitoring Location



Ambient Noise Logging Results – ICNG Defined Time Periods

Monitoring Period	Noise Level (dBA)			
	RBL	LAeq	L10	L1
Daytime	32	47	48	56
Evening	30	48	50	58
Night-time	25	47	48	56

Ambient Noise Logging Results – RNP Defined Time Periods

Monitoring Period	Noise Level (dBA)	
	LAeq(period)	LAeq(1hour)
Daytime (7am-10pm)	48	49
Night-time (10pm-7am)	46	48

Attended Noise Measurement Results

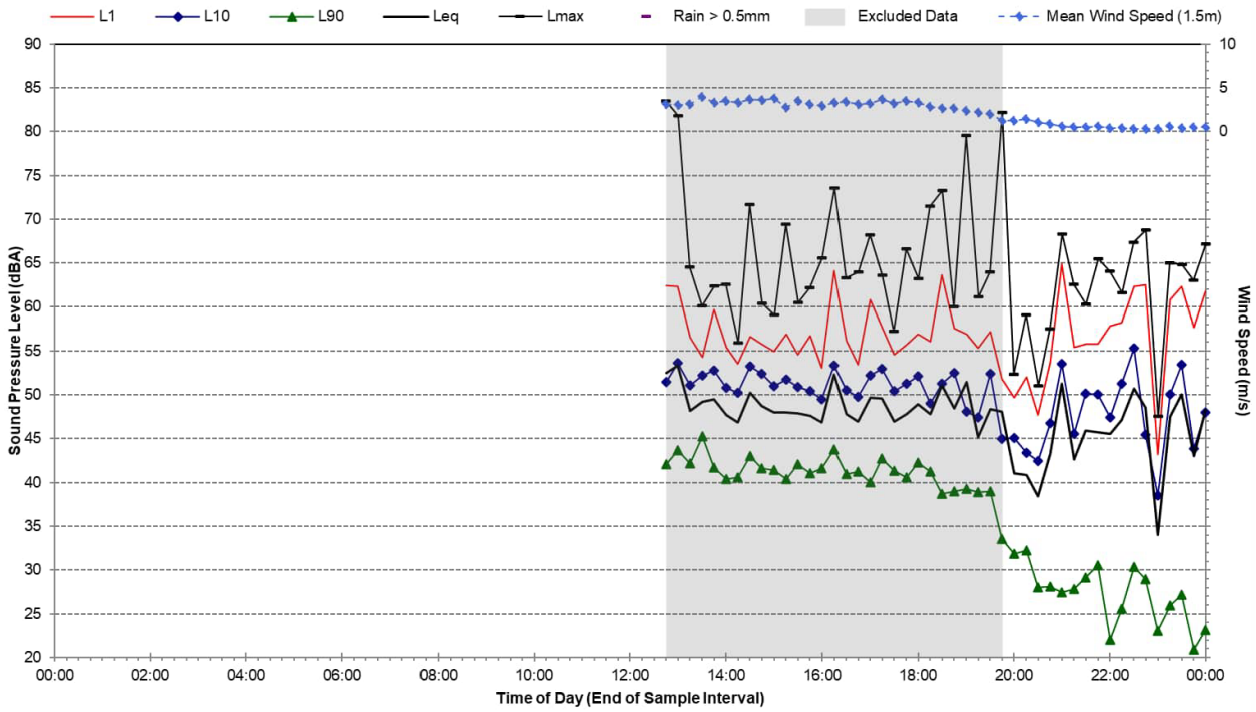
Date	Start Time	Measured Noise Level (dBA)		
		LA90	LAeq	LAmax
8/11/2024	12:39	44	49	61

Photo of Noise Monitoring Location



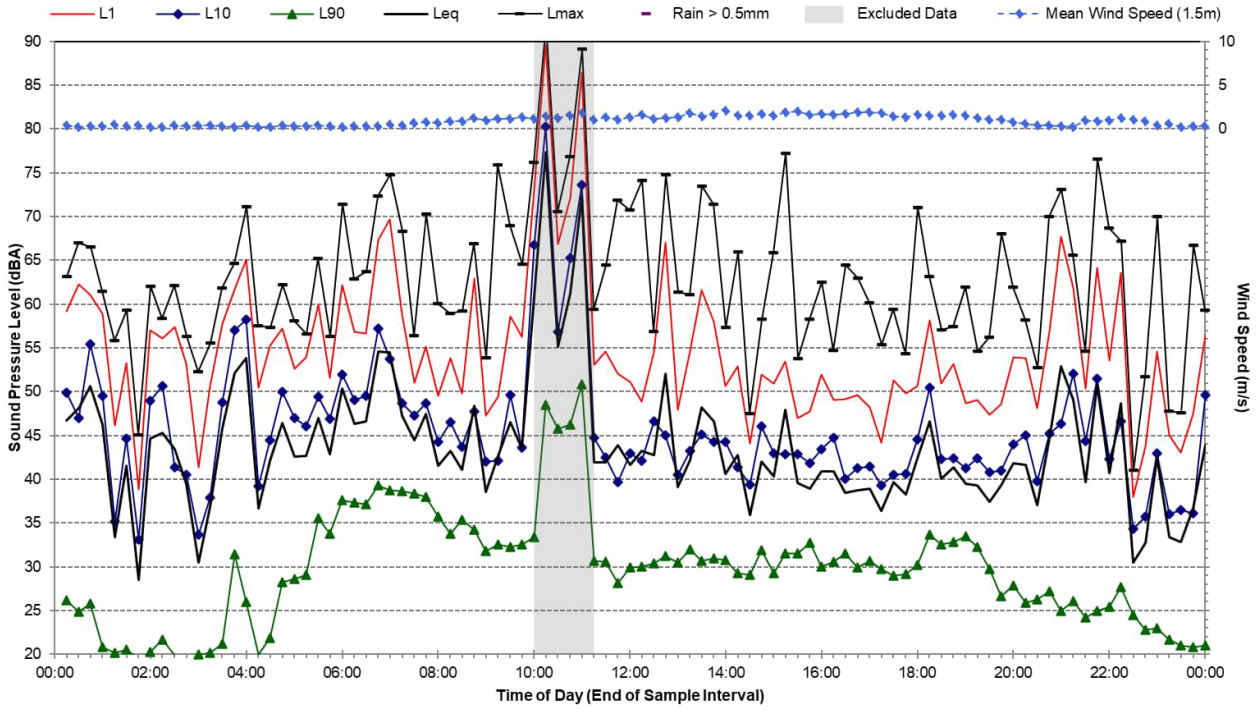
Statistical Ambient Noise Levels

L.01 42 Morris Hill Road, Wallendbeen - Friday, 8 November 2024



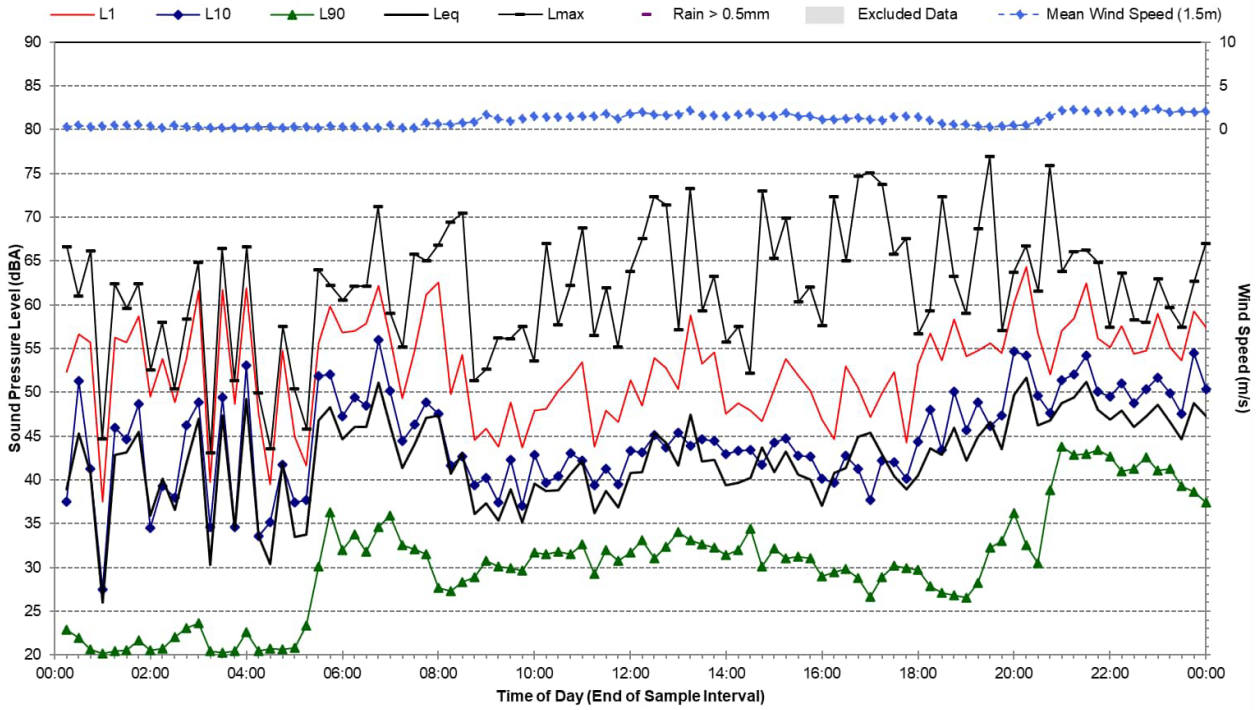
Statistical Ambient Noise Levels

L.01 42 Morris Hill Road, Wallendbeen - Saturday, 9 November 2024



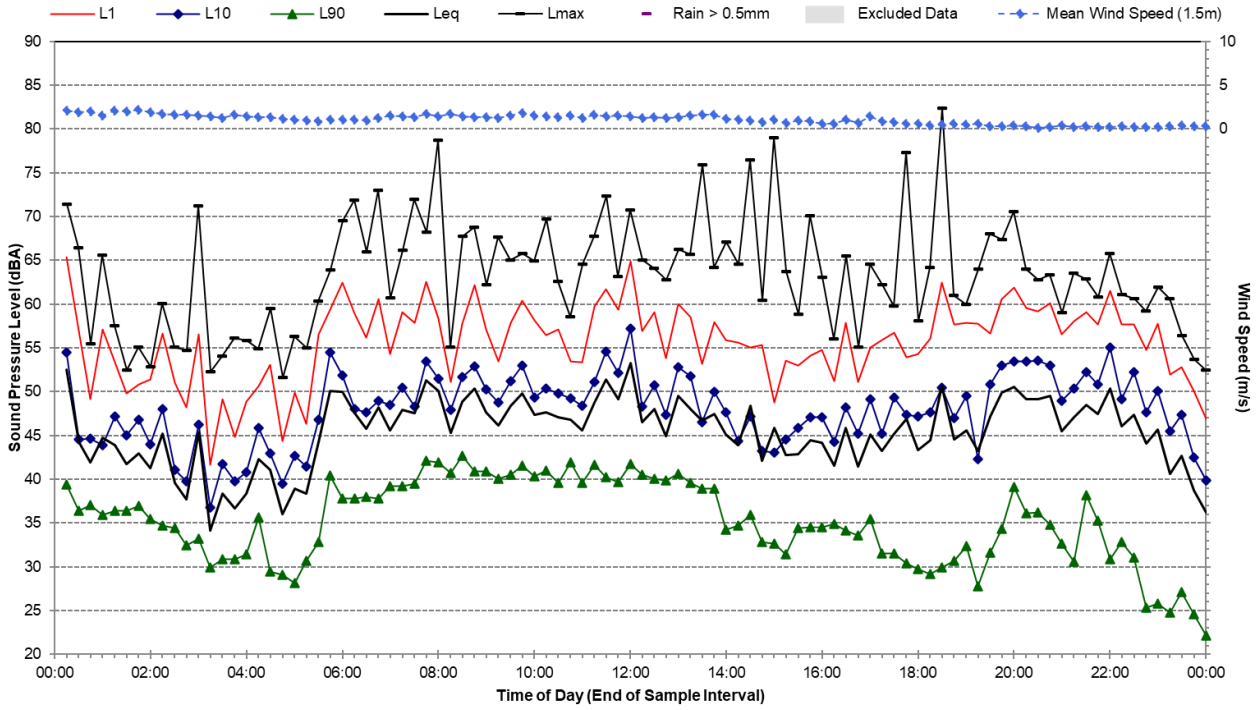
Statistical Ambient Noise Levels

L.01 42 Morris Hill Road, Wallendbeen - Sunday, 10 November 2024



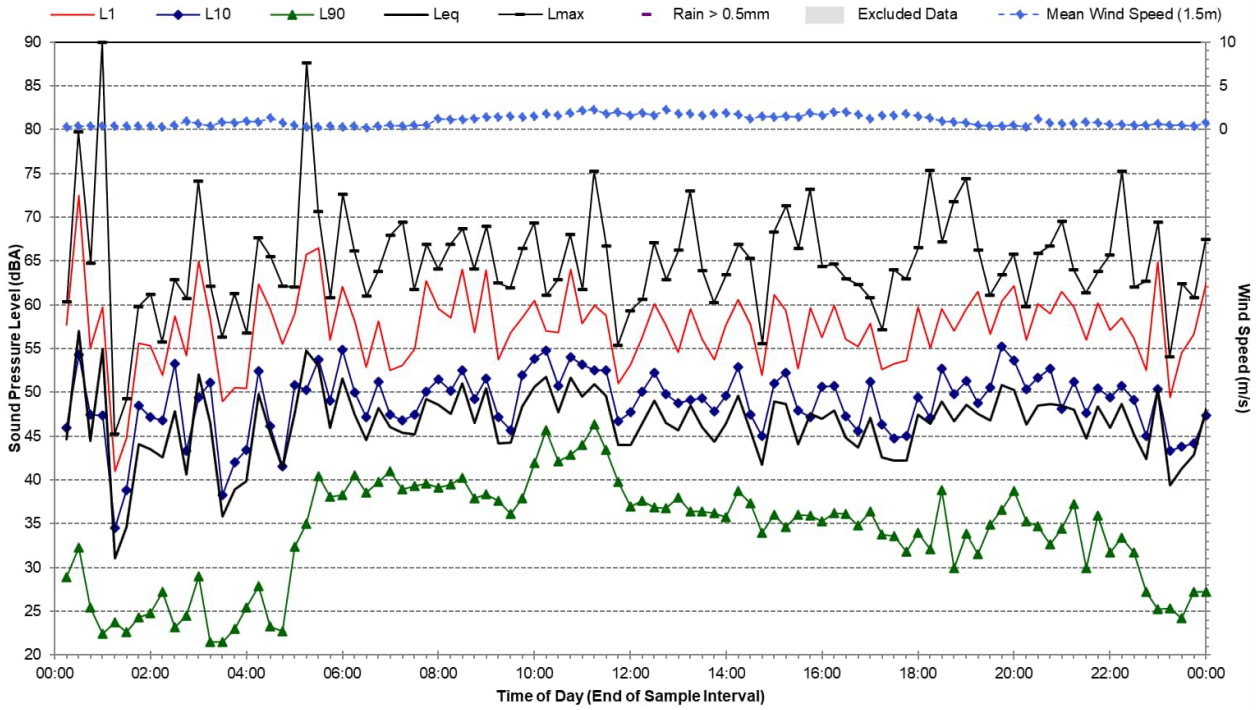
Statistical Ambient Noise Levels

L.01 42 Morris Hill Road, Wallendbeen - Monday, 11 November 2024



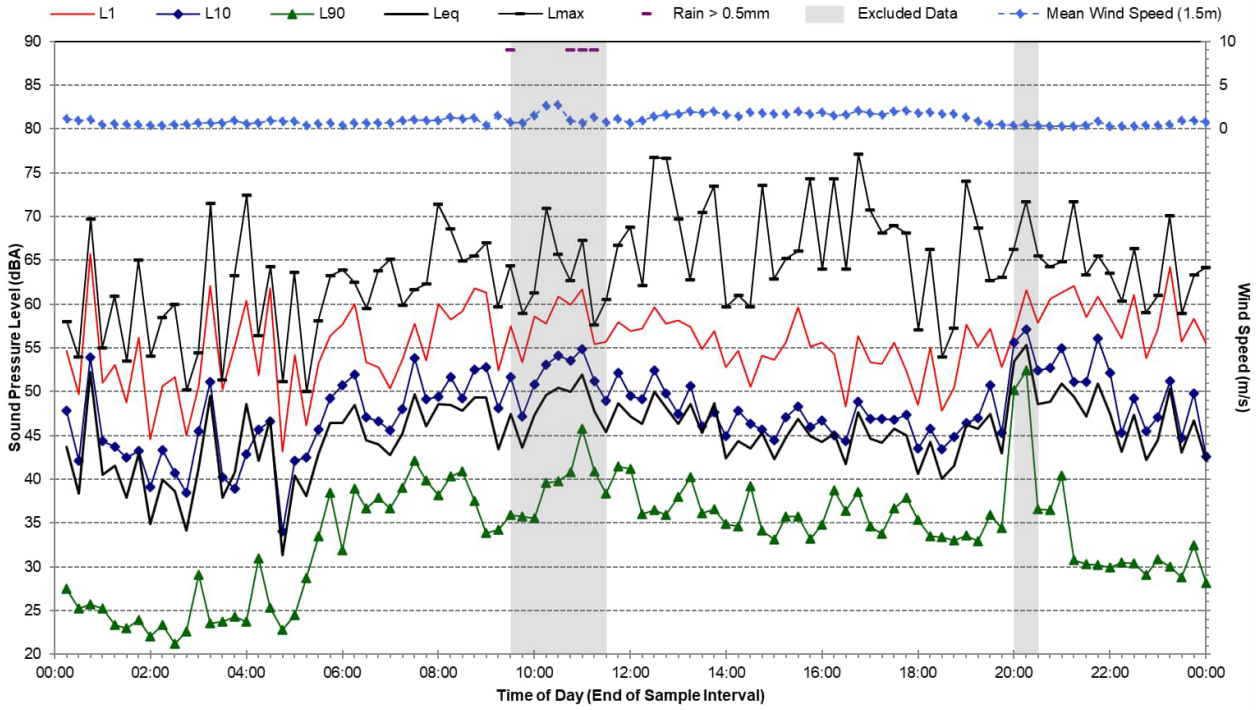
Statistical Ambient Noise Levels

L.01 42 Morris Hill Road, Wallendbeen - Tuesday, 12 November 2024



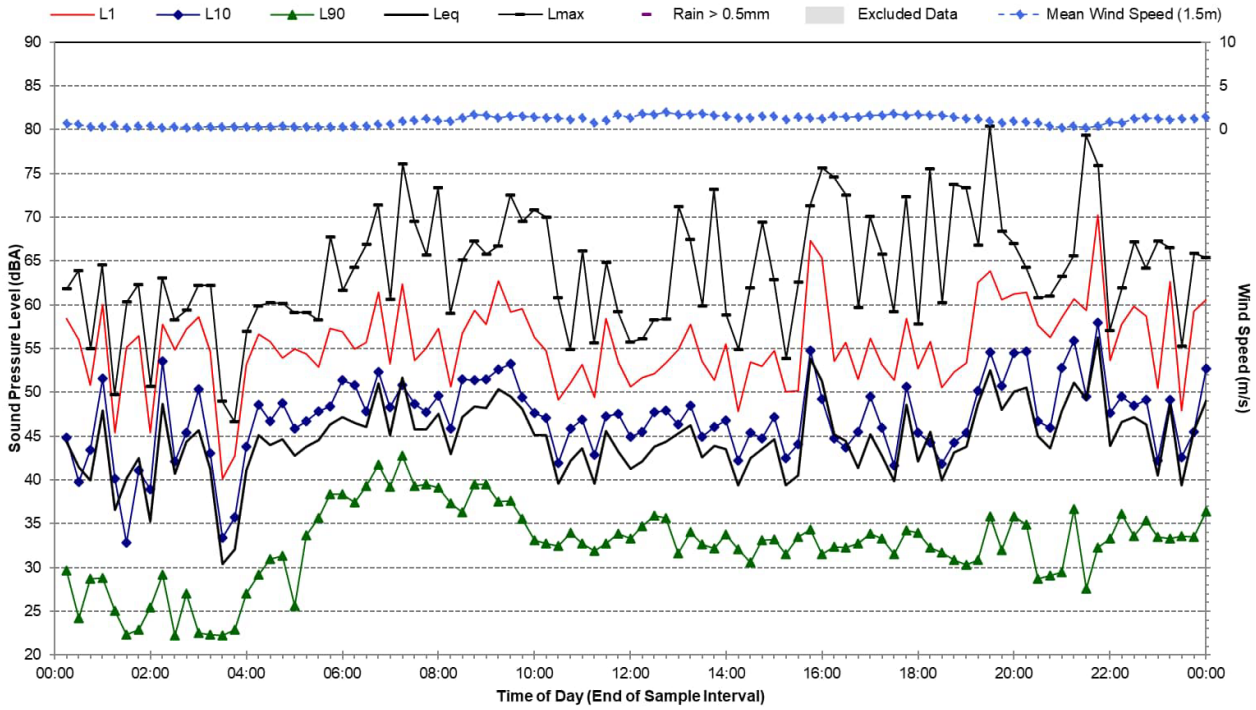
Statistical Ambient Noise Levels

L.01 42 Morris Hill Road, Wallendbeen - Wednesday, 13 November 2024



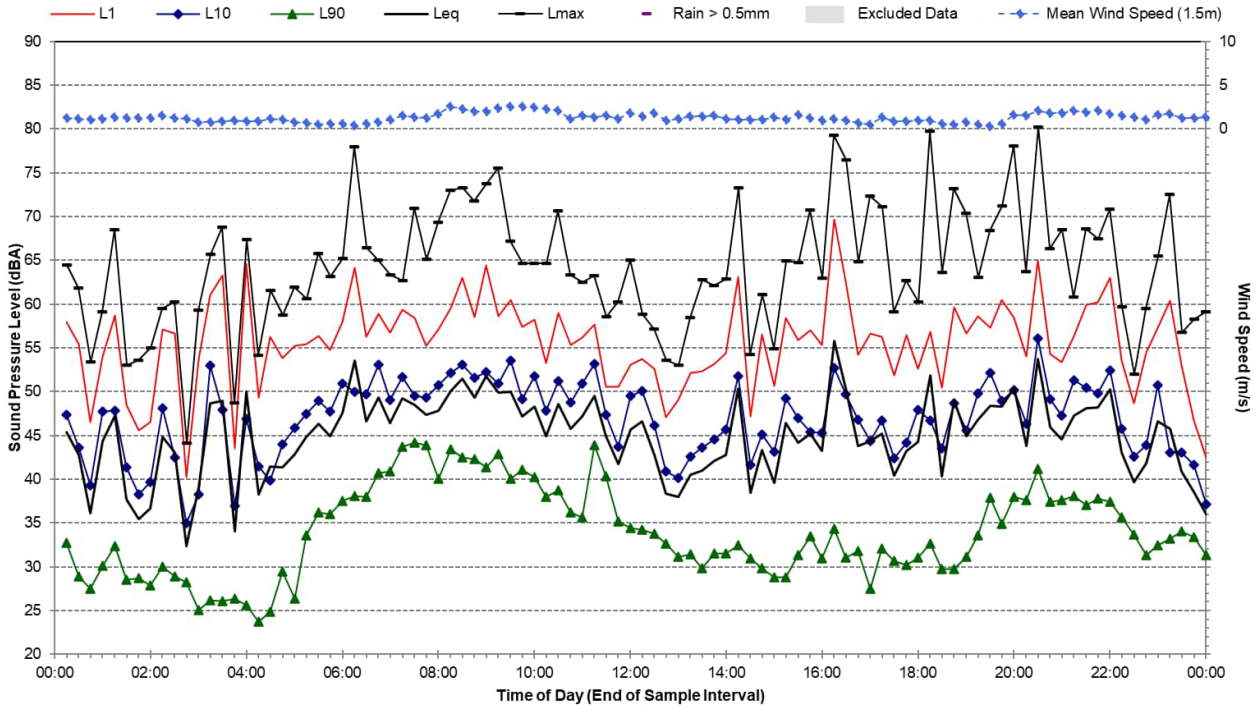
Statistical Ambient Noise Levels

L.01 42 Morris Hill Road, Wallendbeen - Thursday, 14 November 2024



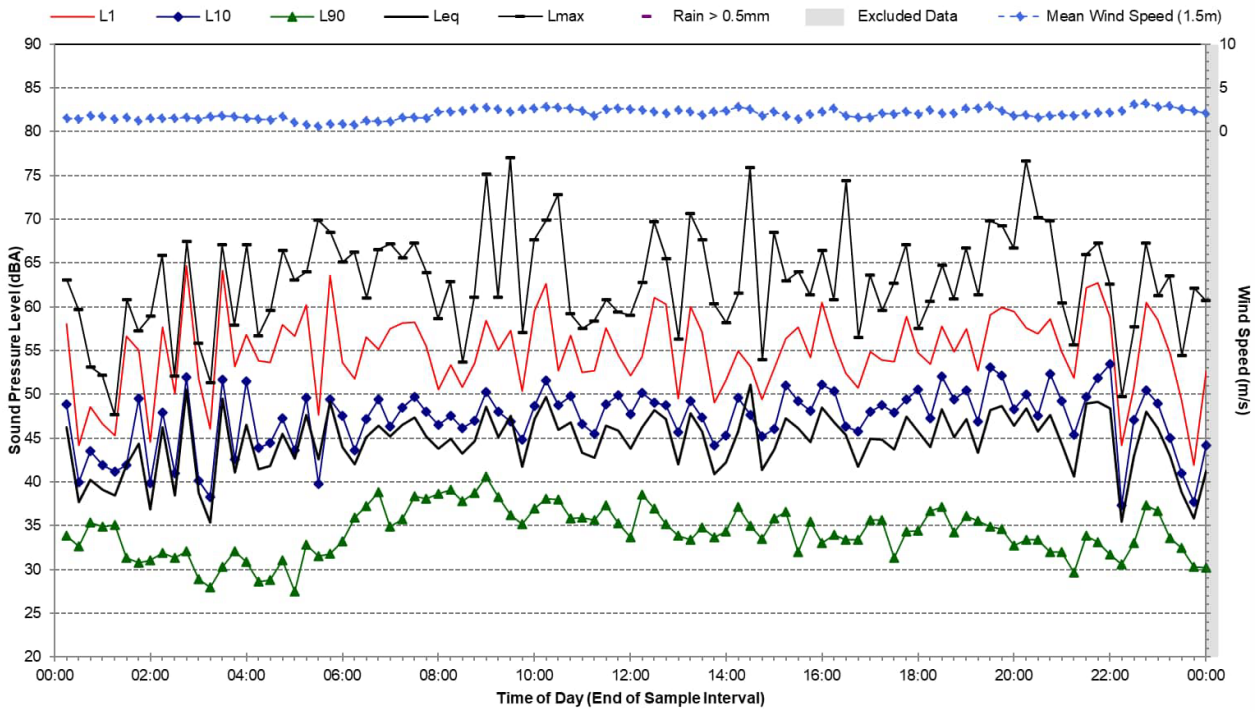
Statistical Ambient Noise Levels

L.01 42 Morris Hill Road, Wallendbeen - Friday, 15 November 2024



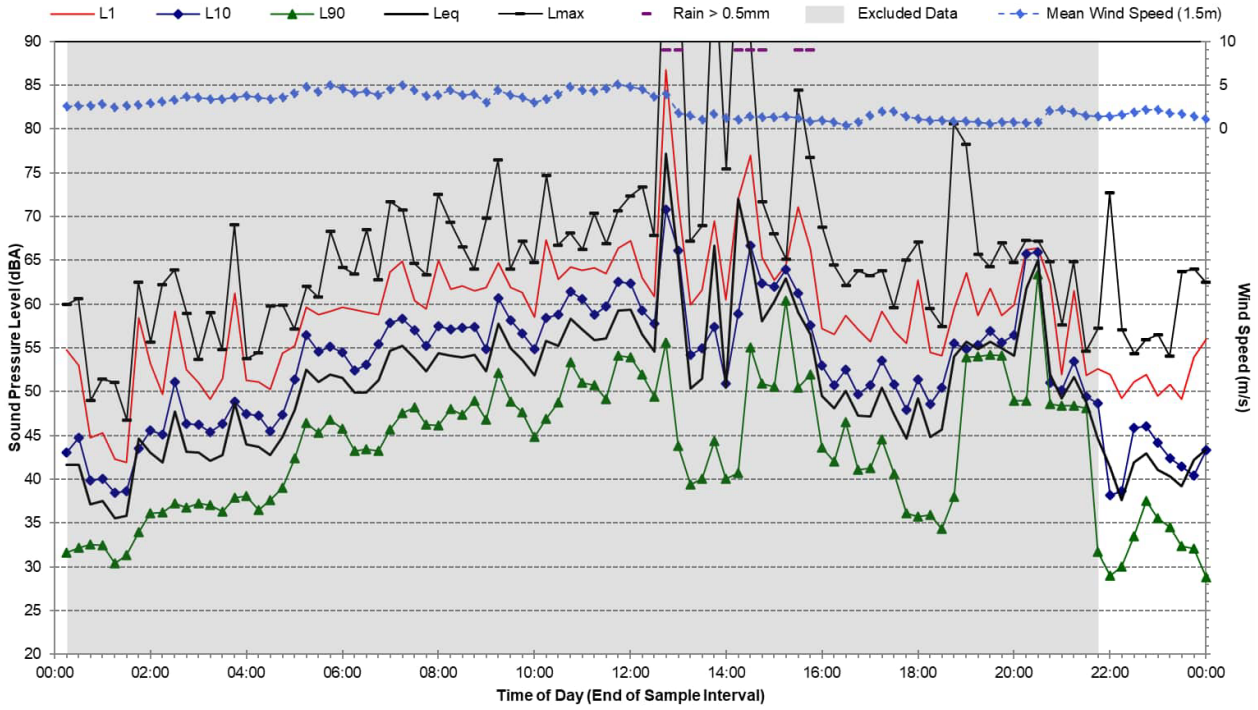
Statistical Ambient Noise Levels

L.01 42 Morris Hill Road, Wallendbeen - Saturday, 16 November 2024



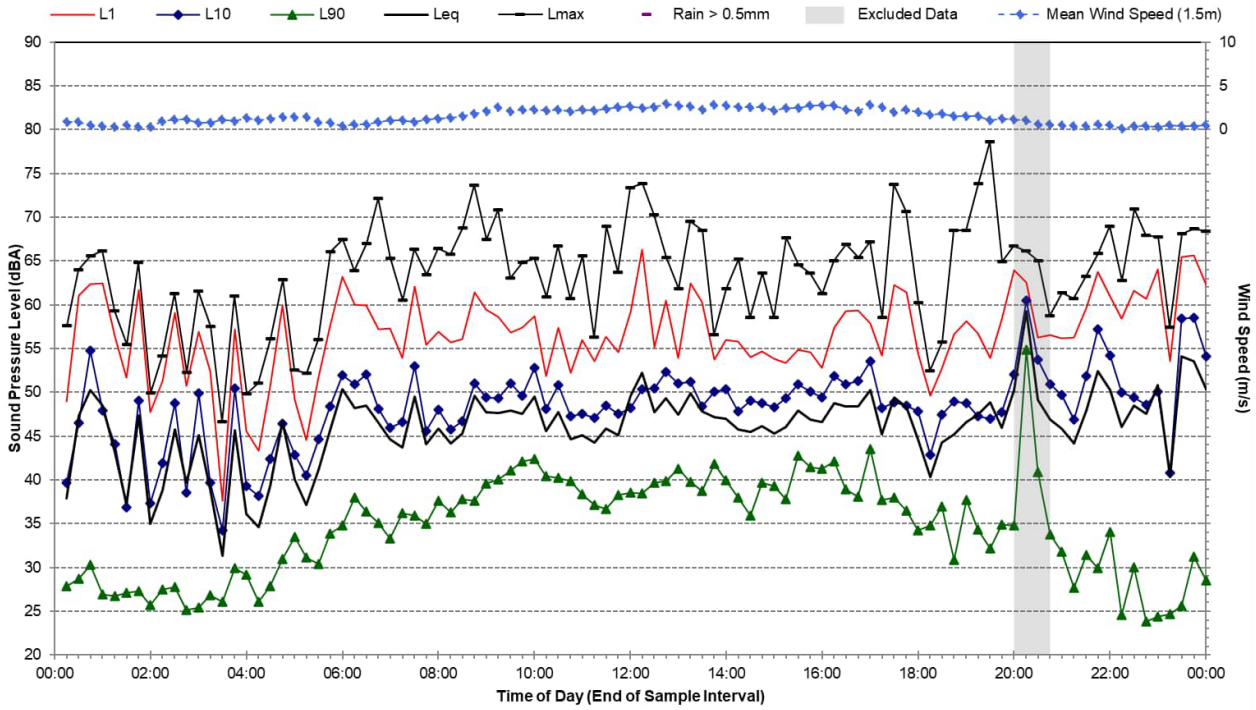
Statistical Ambient Noise Levels

L.01 42 Morris Hill Road, Wallendbeen - Sunday, 17 November 2024



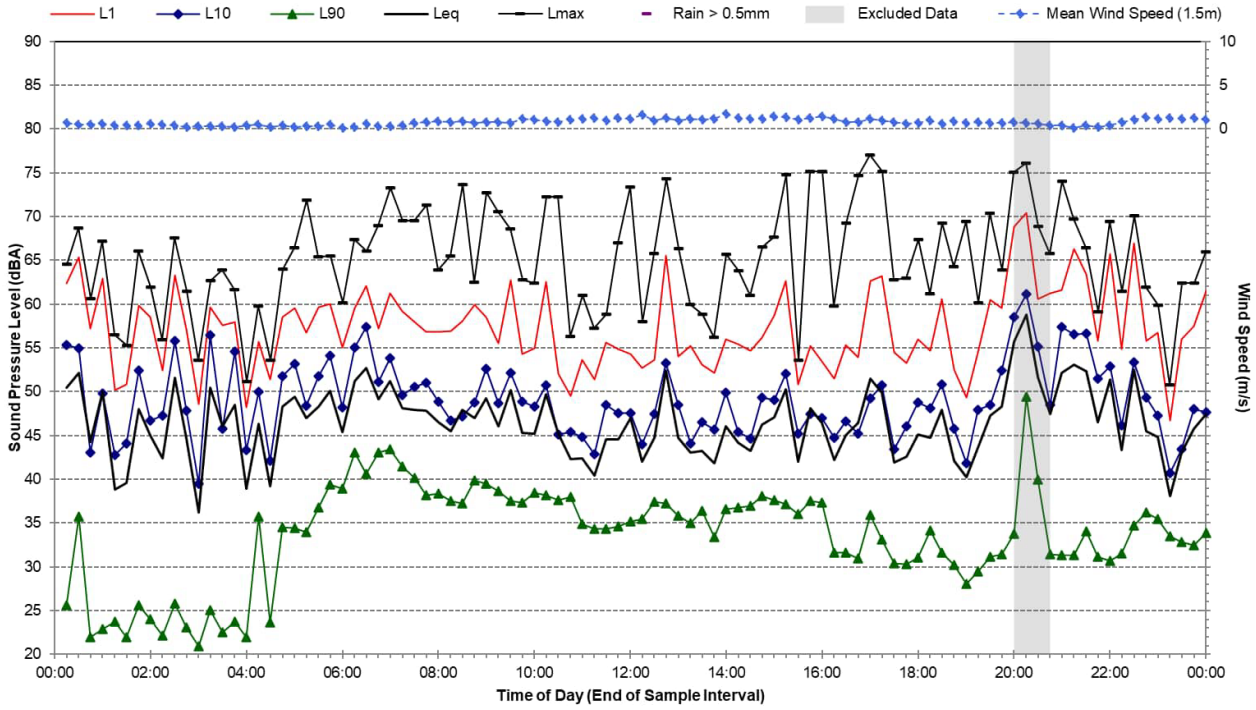
Statistical Ambient Noise Levels

L.01 42 Morris Hill Road, Wallendbeen - Monday, 18 November 2024



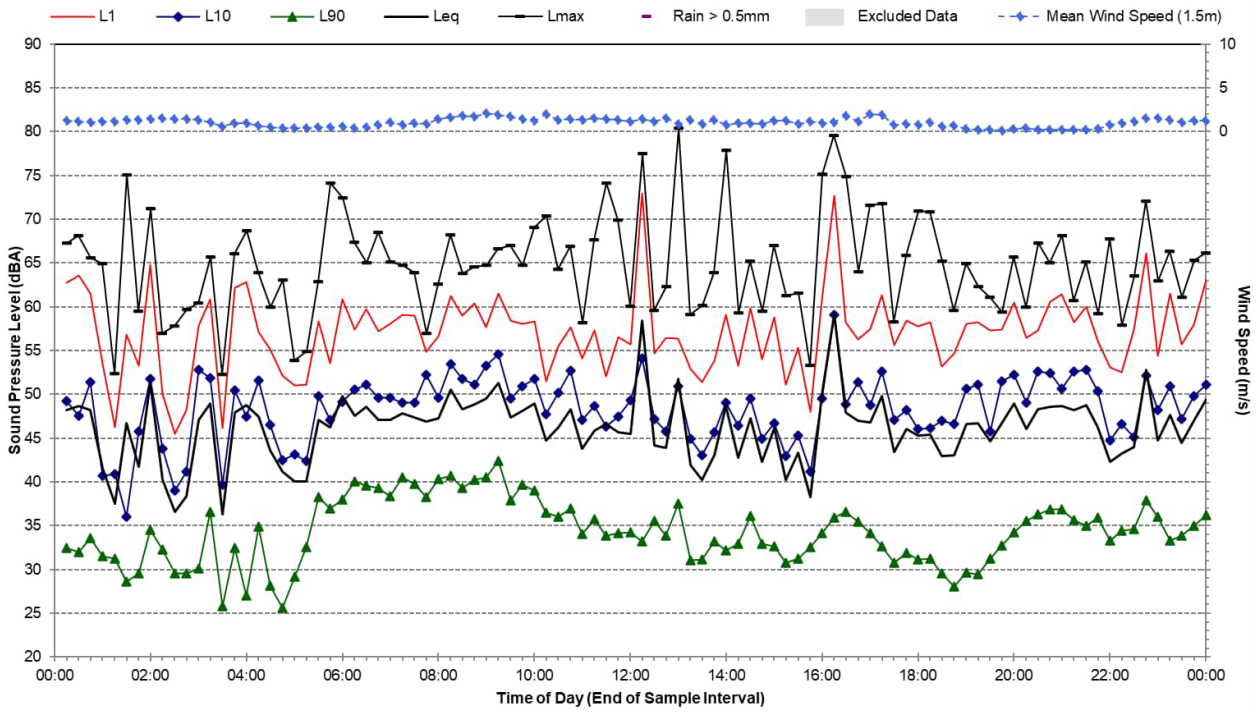
Statistical Ambient Noise Levels

L.01 42 Morris Hill Road, Wallendbeen - Tuesday, 19 November 2024



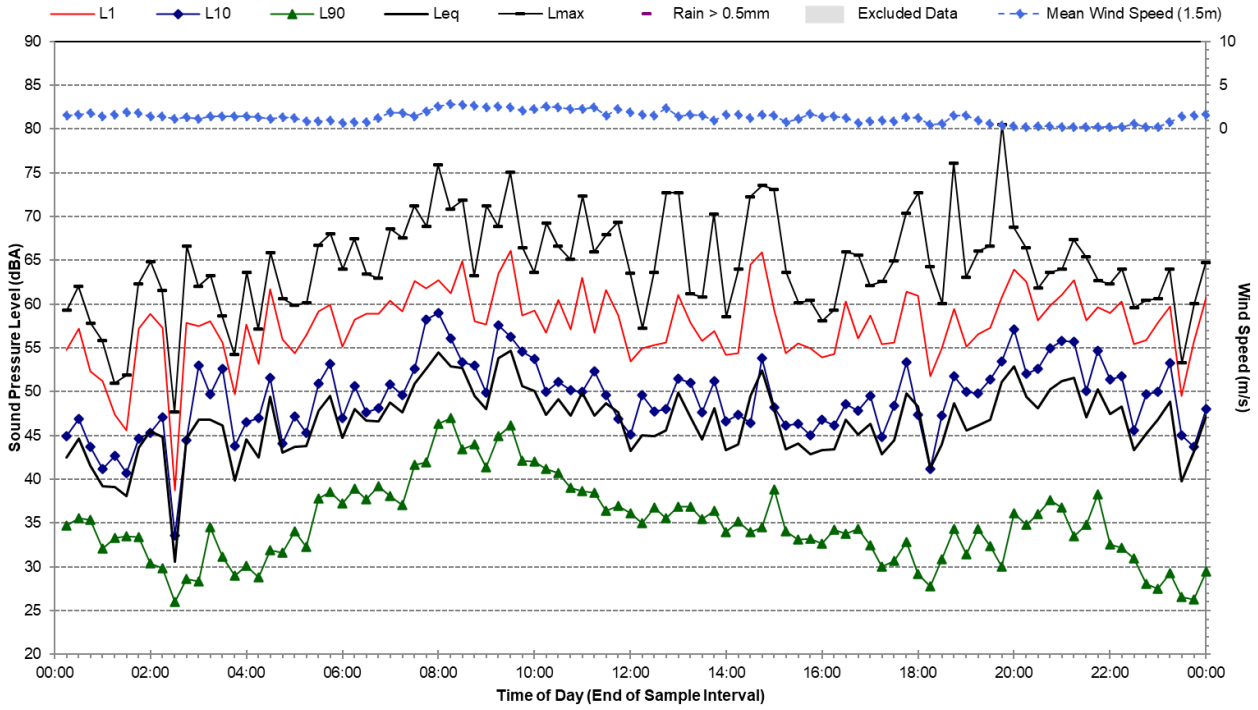
Statistical Ambient Noise Levels

L.01 42 Morris Hill Road, Wallendbeen - Wednesday, 20 November 2024



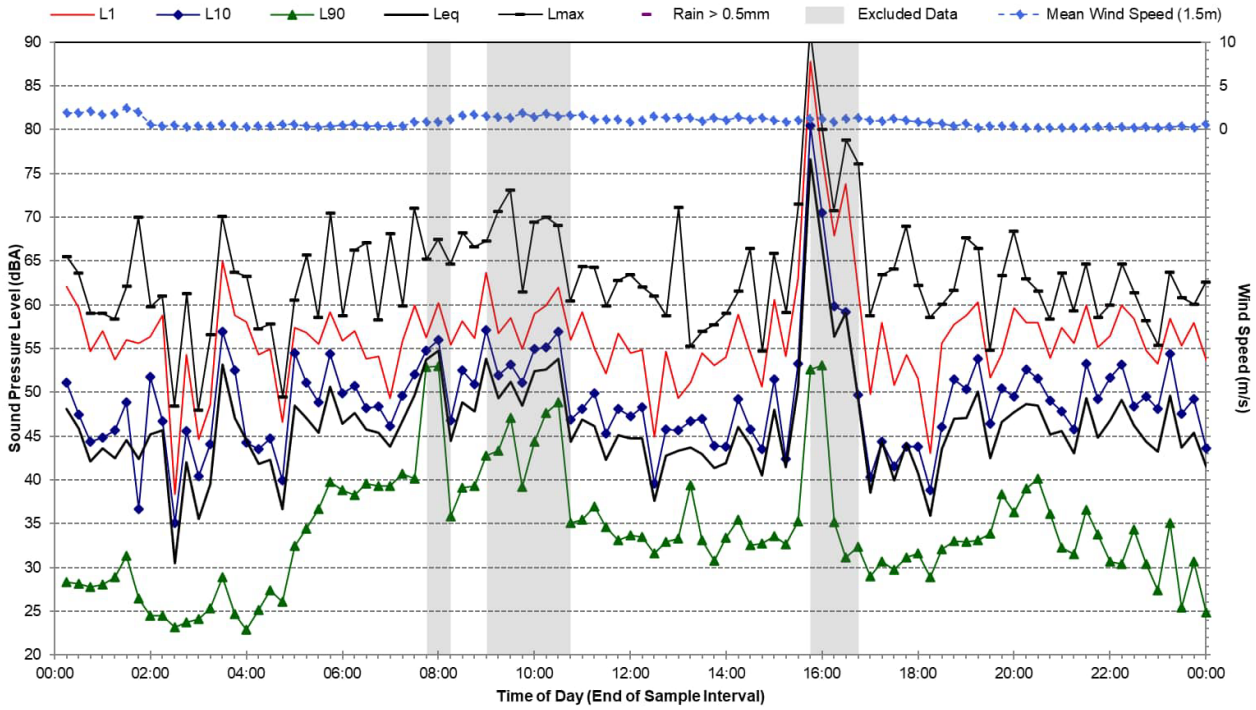
Statistical Ambient Noise Levels

L.01 42 Morris Hill Road, Wallendbeen - Thursday, 21 November 2024



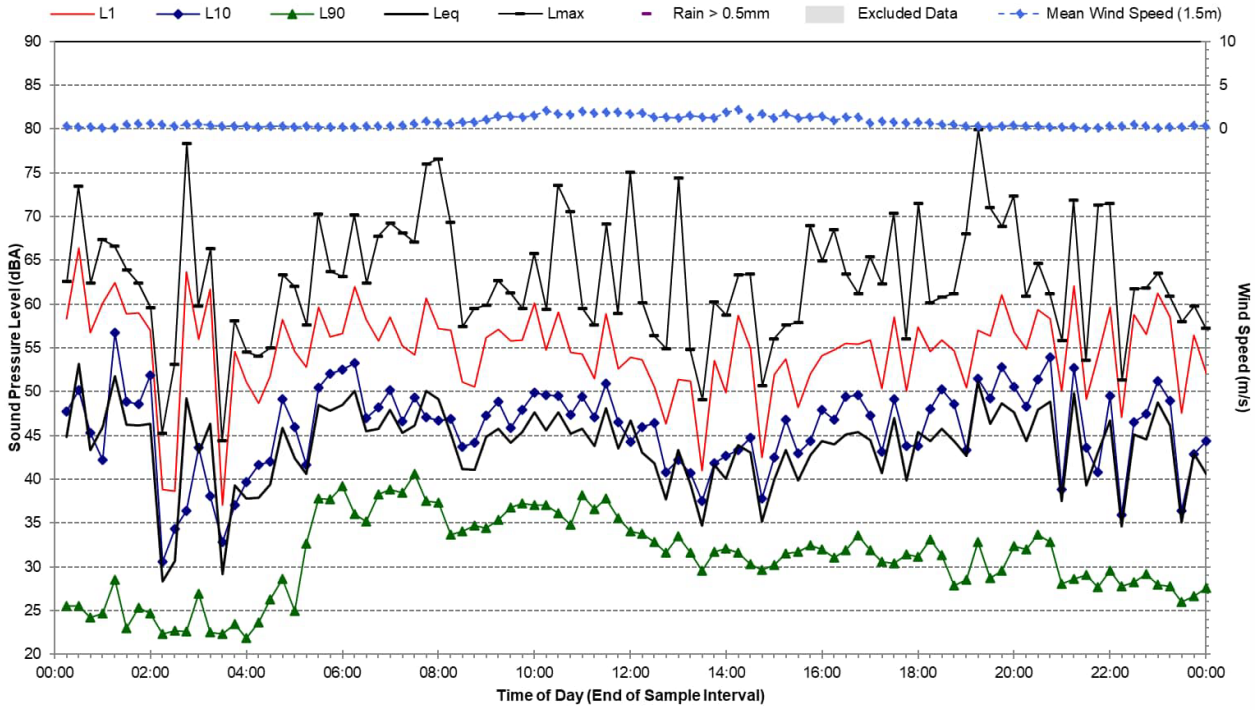
Statistical Ambient Noise Levels

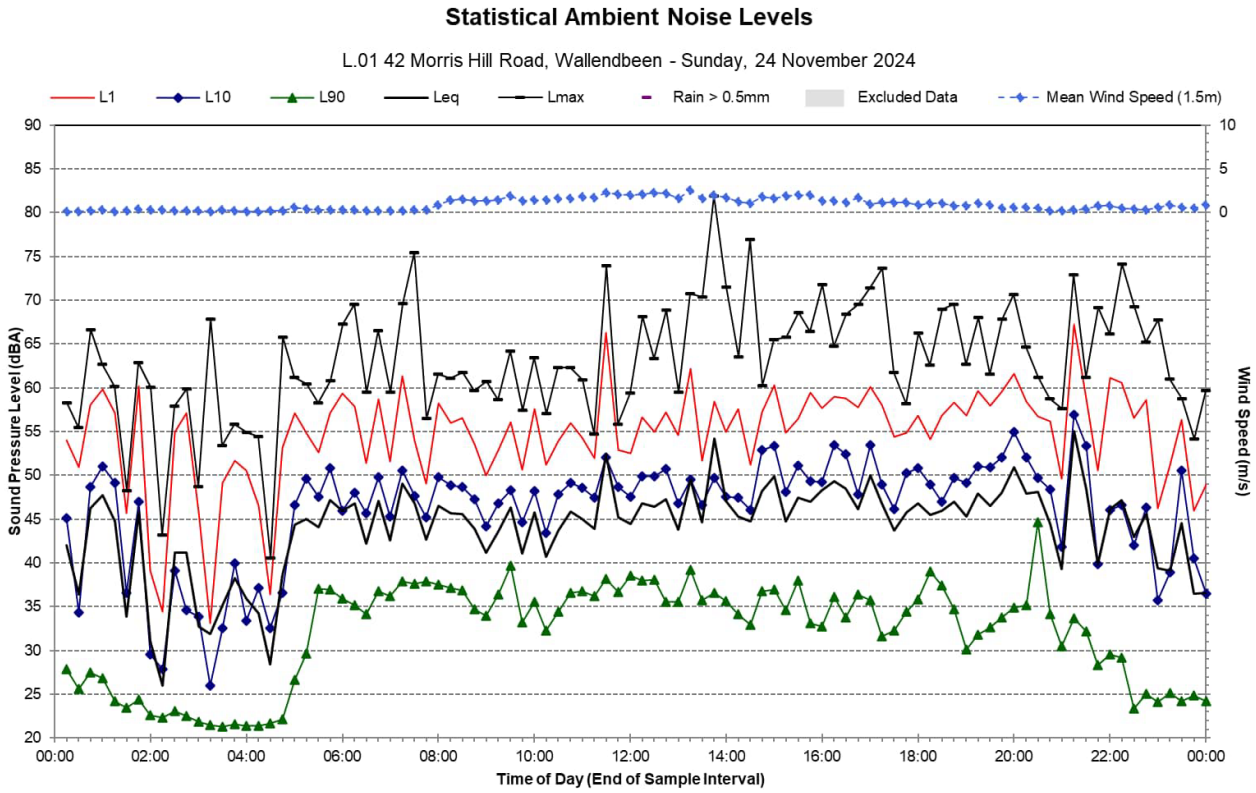
L.01 42 Morris Hill Road, Wallendbeen - Friday, 22 November 2024

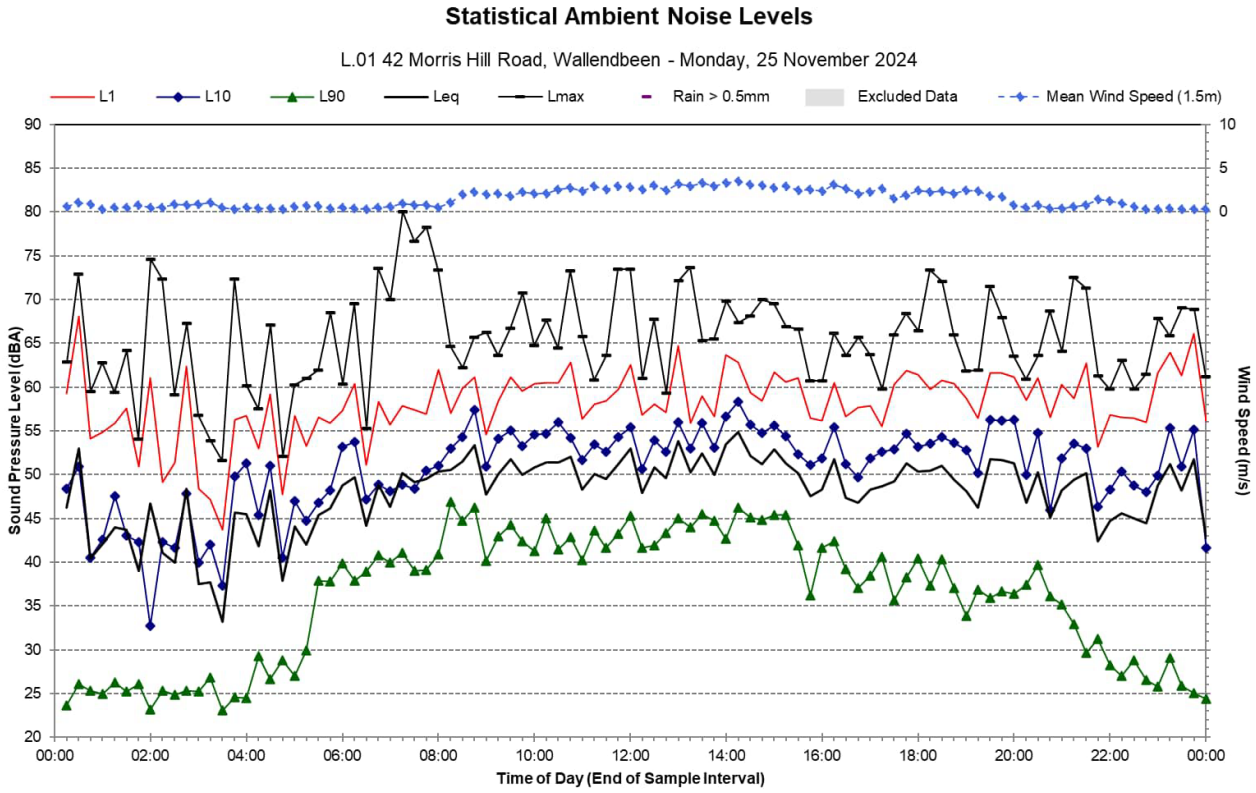


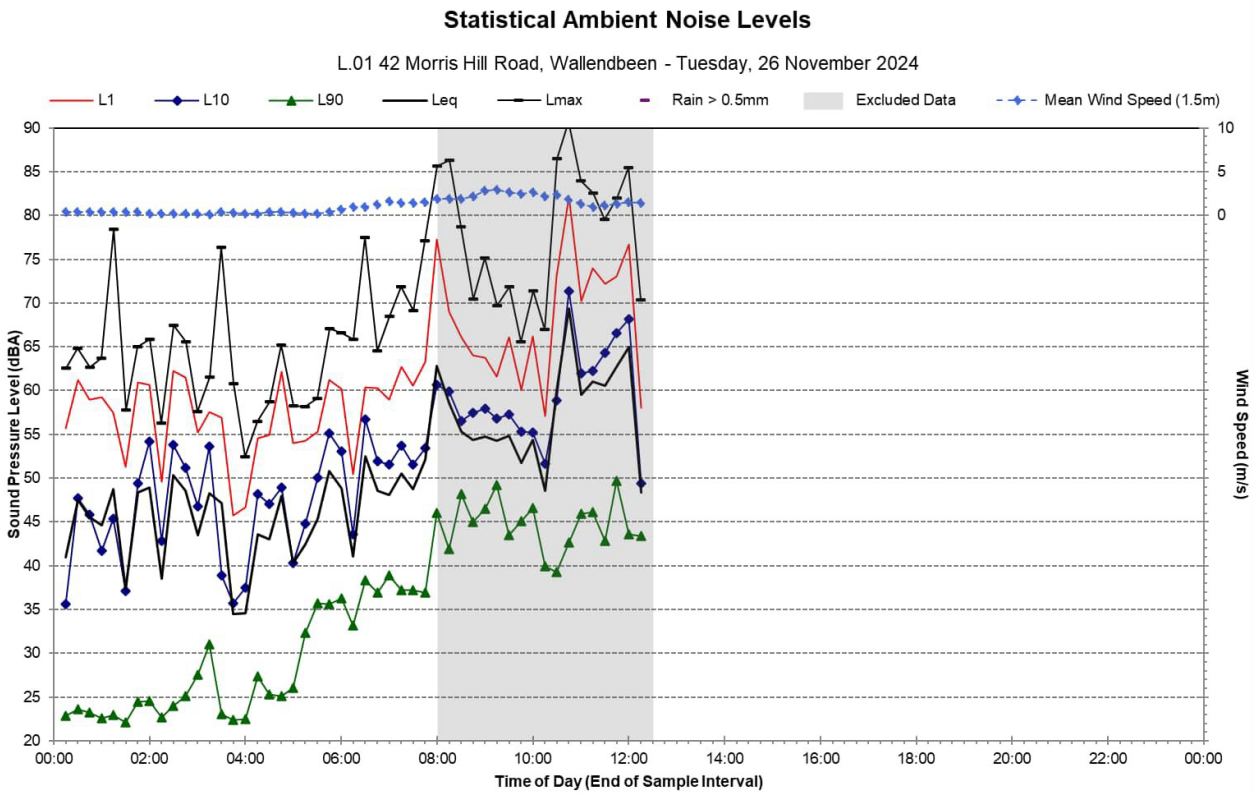
Statistical Ambient Noise Levels

L.01 42 Morris Hill Road, Wallendbeen - Saturday, 23 November 2024




Statistical Ambient Noise Levels
L.01 42 Morris Hill Road, Wallendbeen - Sunday, 24 November 2024
L1
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L.01 42 Morris Hill Road, Wallendbeen - Monday, 25 November 2024
L1
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L.01 42 Morris Hill Road, Wallendbeen - Tuesday, 26 November 2024
L1
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

Noise Monitoring Location	L.02
Noise Monitoring Address	**1-3 Bland Street, Wallendbeen**

Logger Device Type: Svantek 977, Logger Serial No: 98464
Sound Level Meter Device Type: B&K 2250L, Sound Level Meter Serial No: 3004635

Ambient noise logger deployed at 1-3 Bland Street, Wallendbeen. Logger located on fence line of the property with view to Burley Griffin Way around 150 m to the south.

Attended noise measurements indicate road traffic noise and rail noise contribute to the ambient noise environment at this location. Natural noise sources such as wind also contribute to the ambient noise environment.

Recorded Noise Levels (LAmax) 8/11/2024:

Traffic – 54 to 59 dBA
Dog Barking – 75 to 79 dBA
Train – 60 dBA
Wind – 58 to 59 dBA

Map of Noise Monitoring Location



Ambient Noise Logging Results – ICNG Defined Time Periods

Monitoring Period	Noise Level (dBA)			
	RBL	LAeq	L10	L1
Daytime	32	47	47	55
Evening	32	49	48	56
Night-time	29	47	46	53

Ambient Noise Logging Results – RNP Defined Time Periods

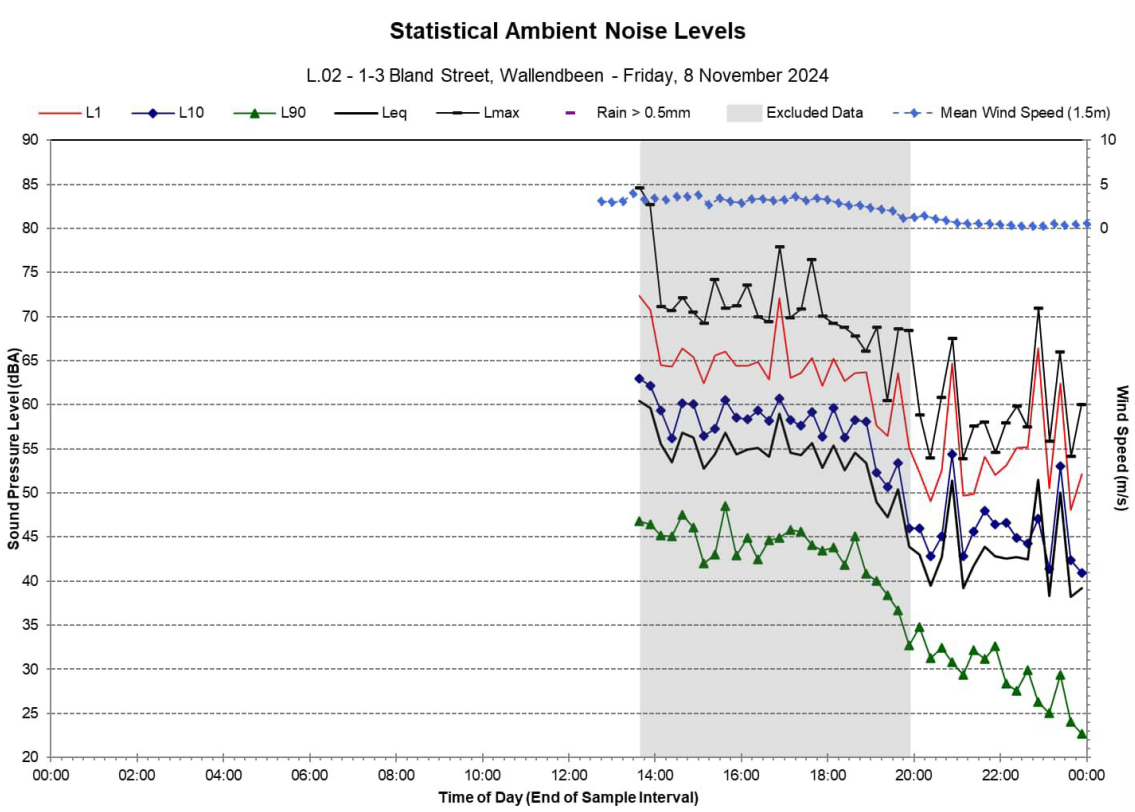
Monitoring Period	Noise Level (dBA)	
	LAeq(period)	LAeq(1hour)
Daytime (7am-10pm)	48	48
Night-time (10pm-7am)	47	49

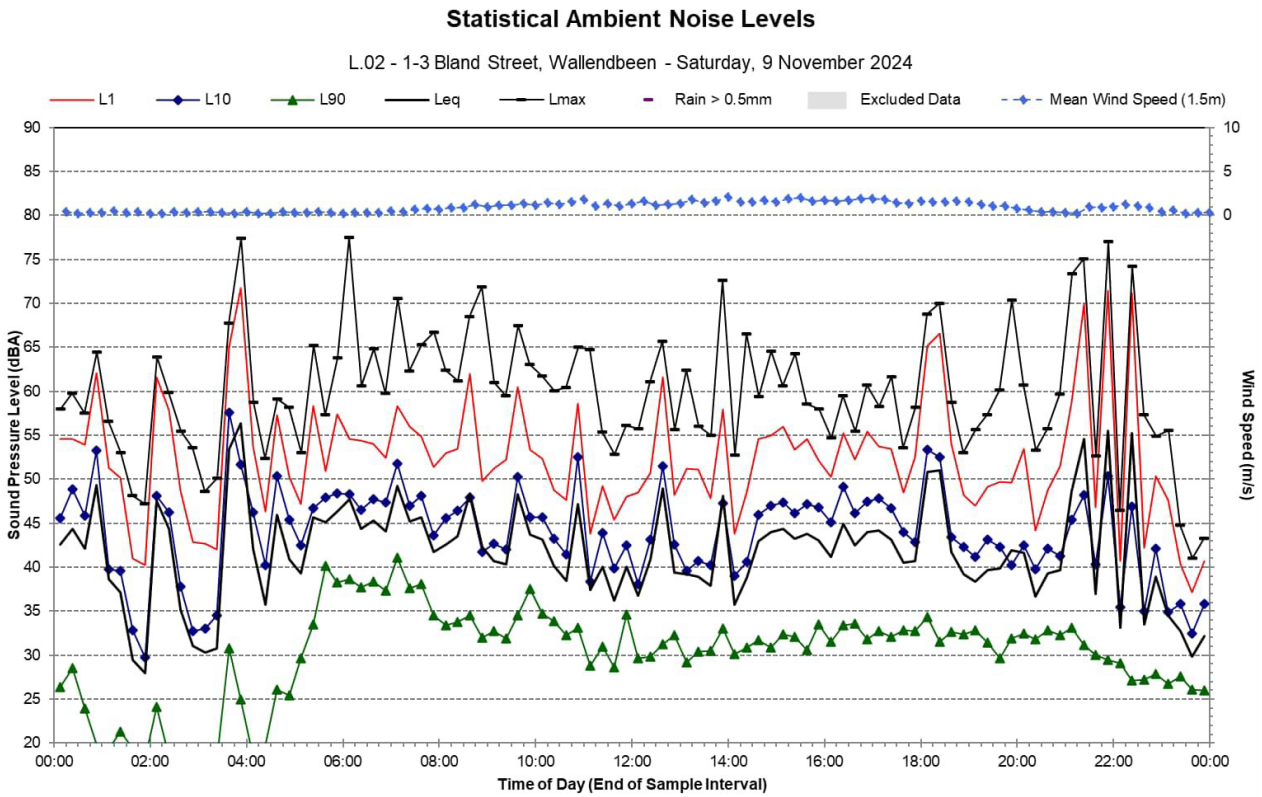
Attended Noise Measurement Results

Date	Start Time	Measured Noise Level (dBA)		
		LA90	LAeq	LAmax
8/11/2024	13:26	46	55	79

Photo of Noise Monitoring Location

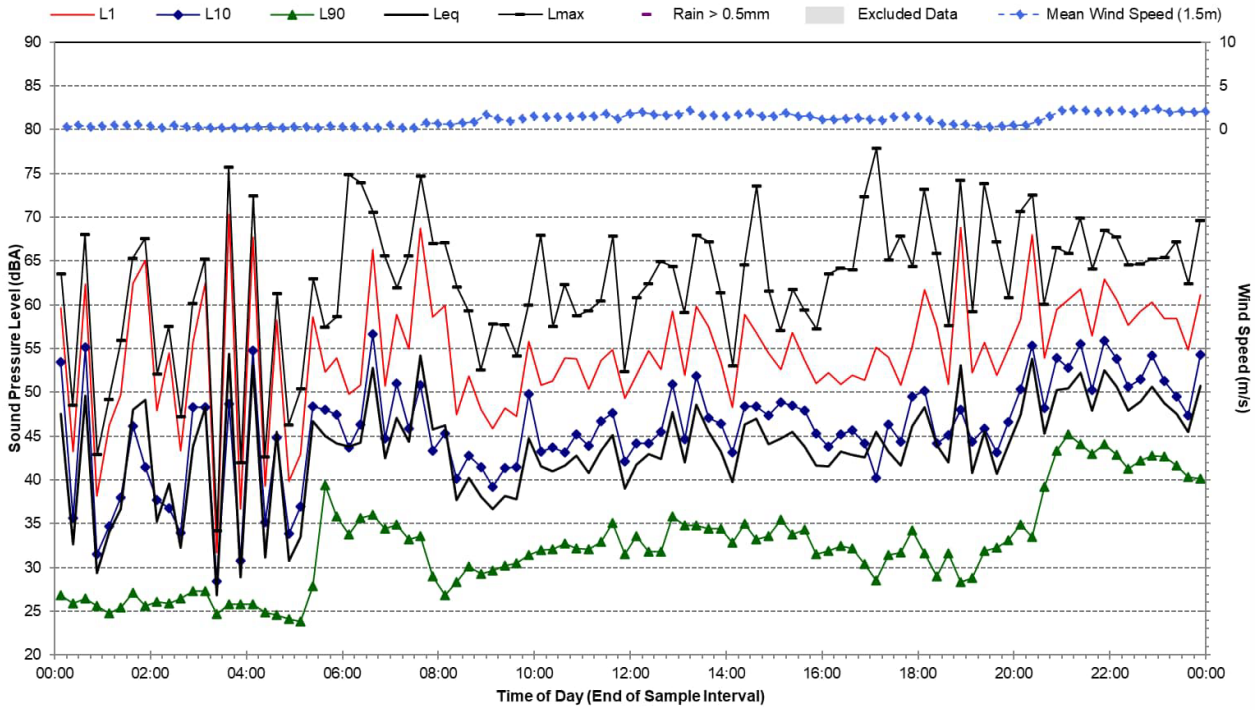



Statistical Ambient Noise Levels
L.02 - 1-3 Bland Street, Wallendbeen - Friday, 8 November 2024
L1
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L.02 - 1-3 Bland Street, Wallendbeen - Saturday, 9 November 2024
L1
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

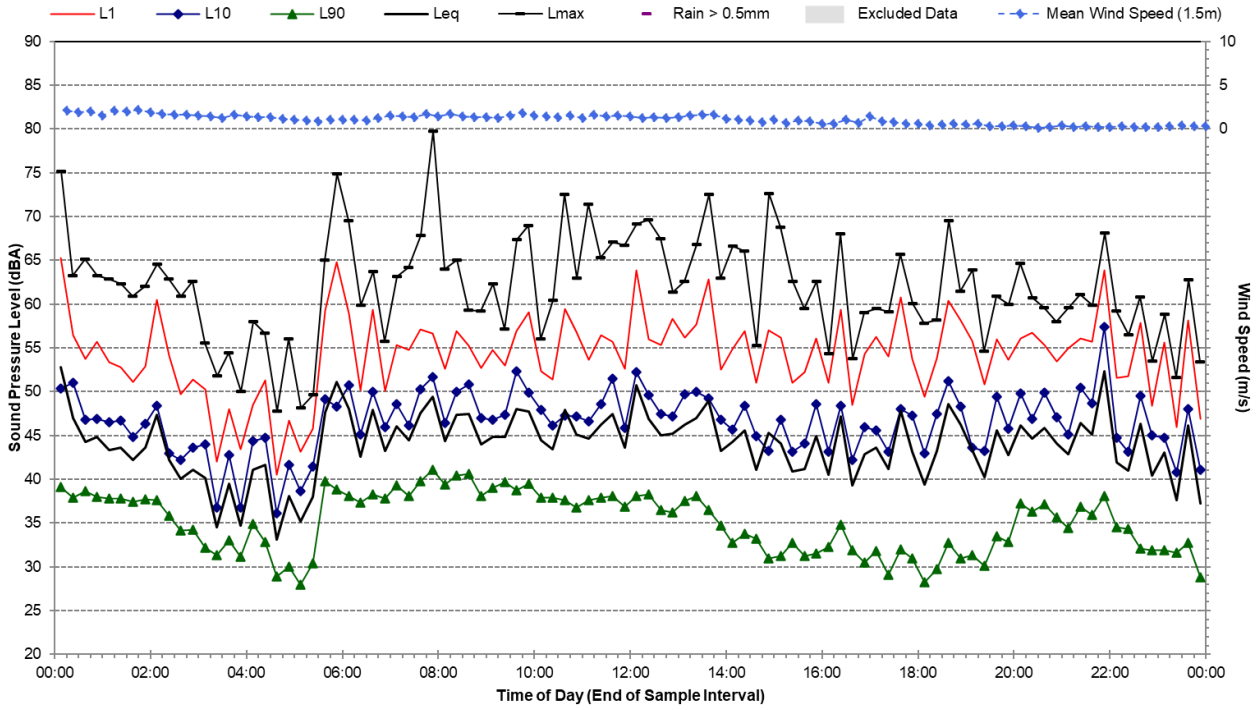
Statistical Ambient Noise Levels

L.02 - 1-3 Bland Street, Wallendbeen - Sunday, 10 November 2024



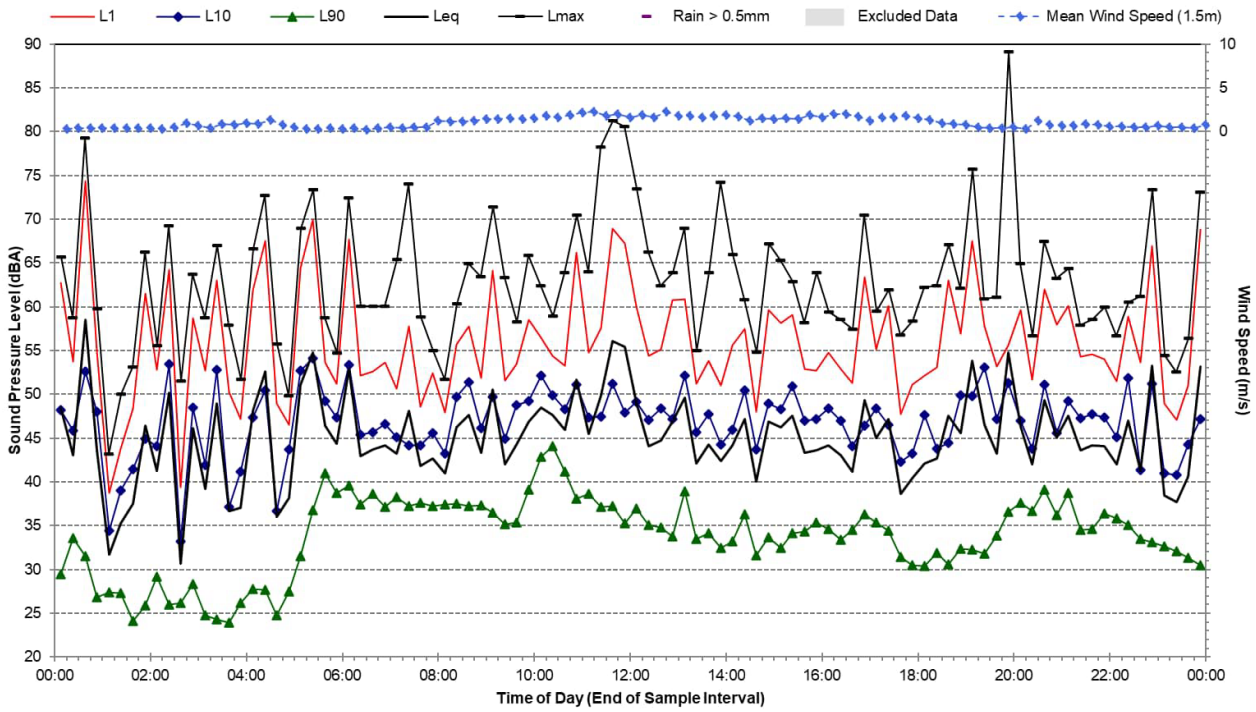
Statistical Ambient Noise Levels

L.02 - 1-3 Bland Street, Wallendbeen - Monday, 11 November 2024



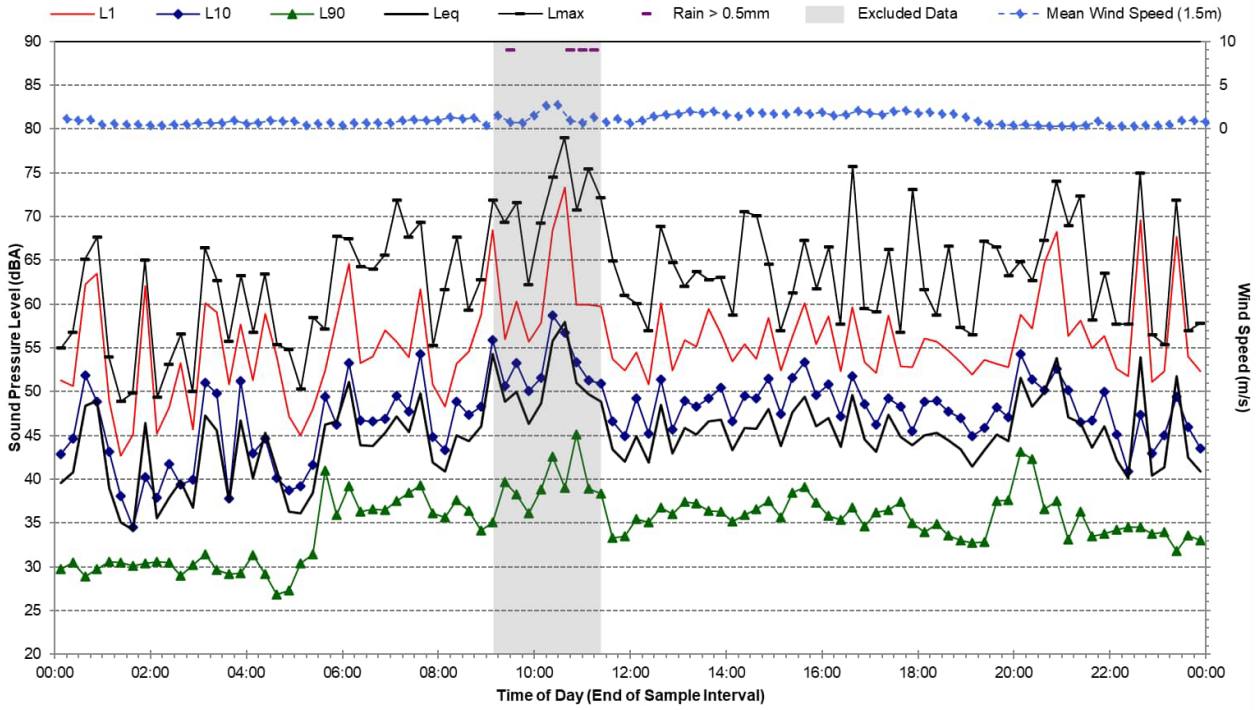
Statistical Ambient Noise Levels

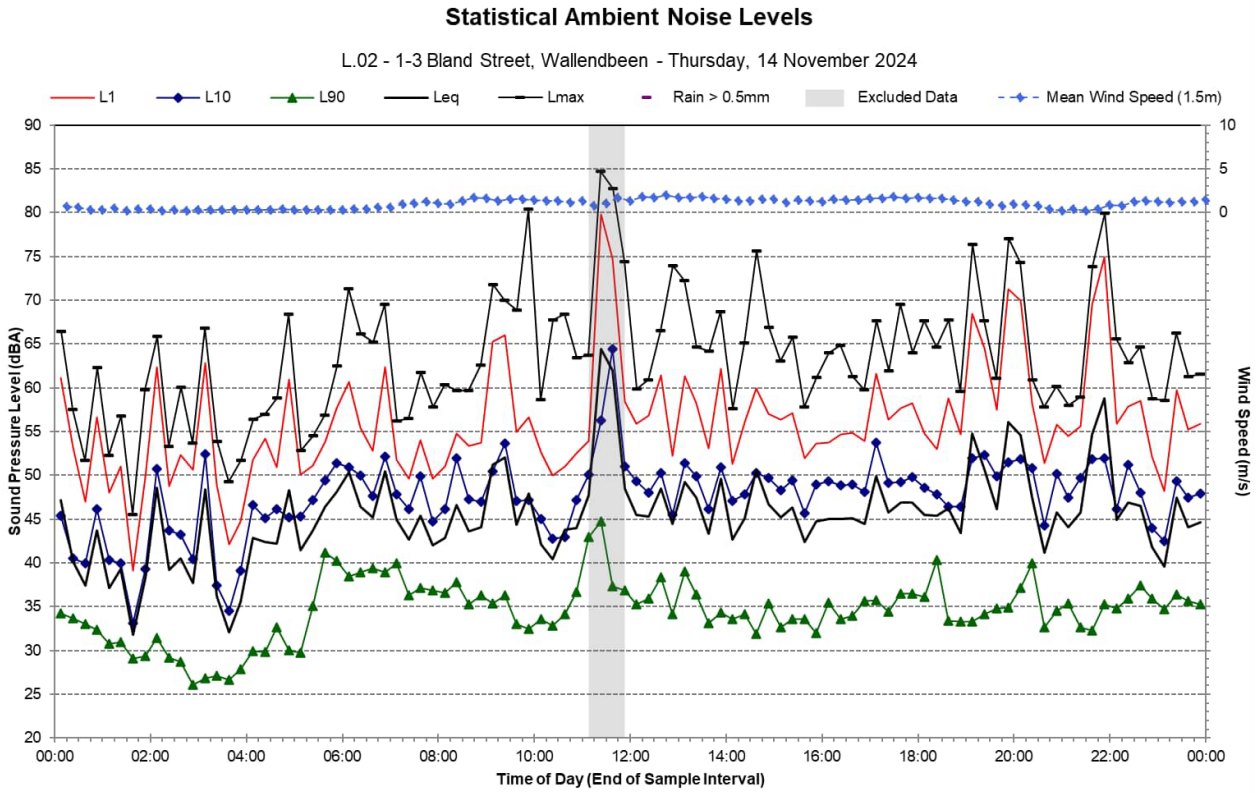
L.02 - 1-3 Bland Street, Wallendbeen - Tuesday, 12 November 2024

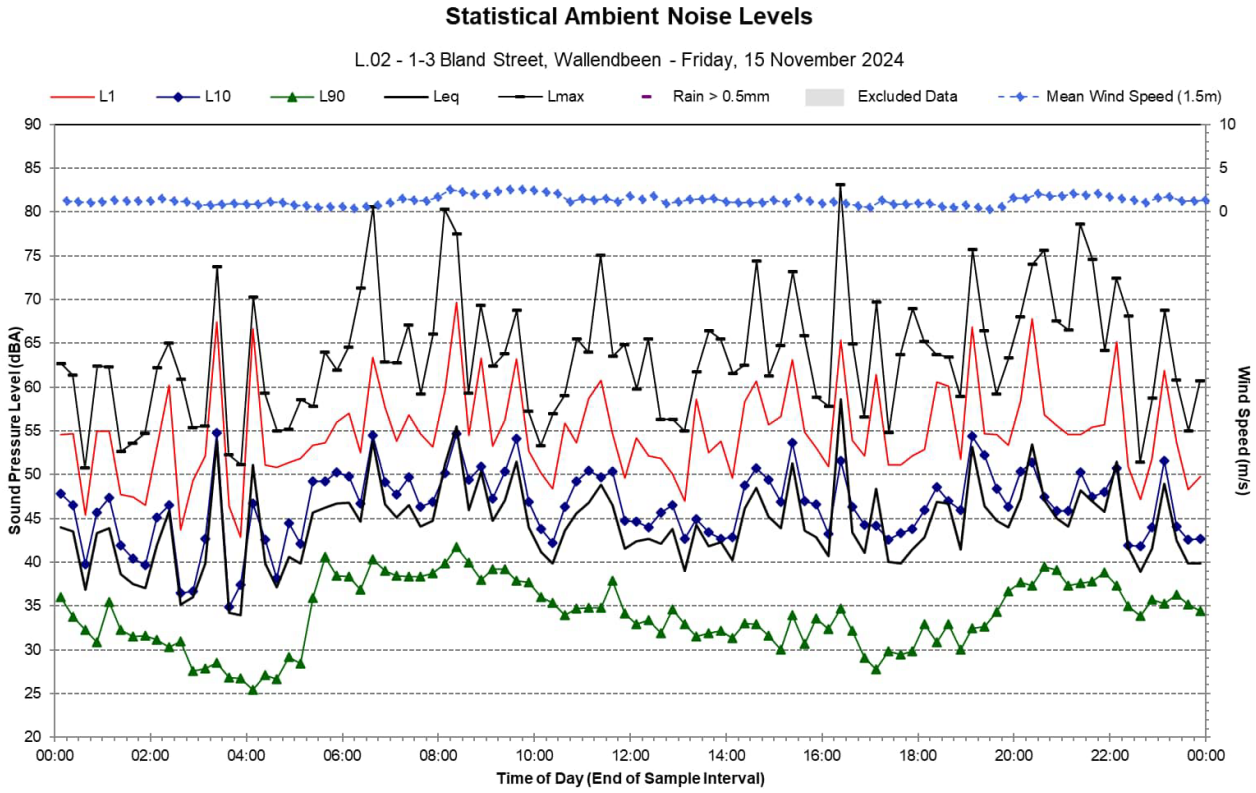


Statistical Ambient Noise Levels

L.02 - 1-3 Bland Street, Wallendbeen - Wednesday, 13 November 2024

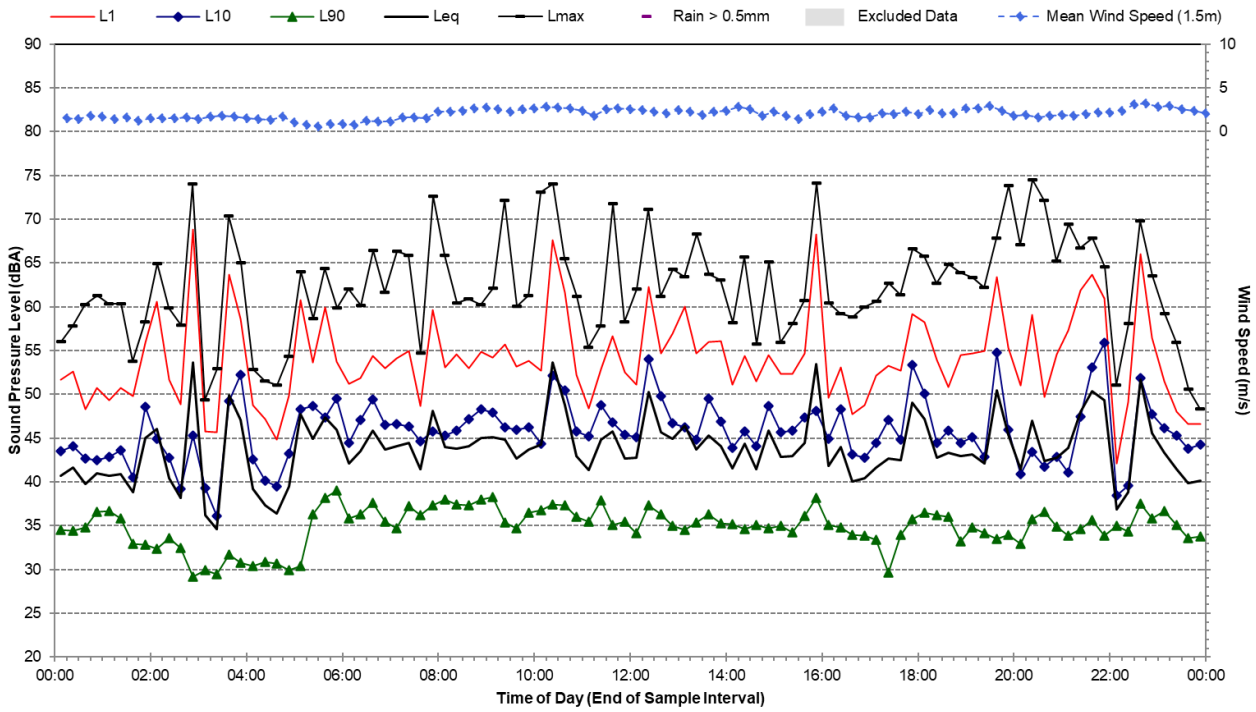



Statistical Ambient Noise Levels
L.02 - 1-3 Bland Street, Wallendbeen - Thursday, 14 November 2024
L1
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L.02 - 1-3 Bland Street, Wallendbeen - Friday, 15 November 2024
L1
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

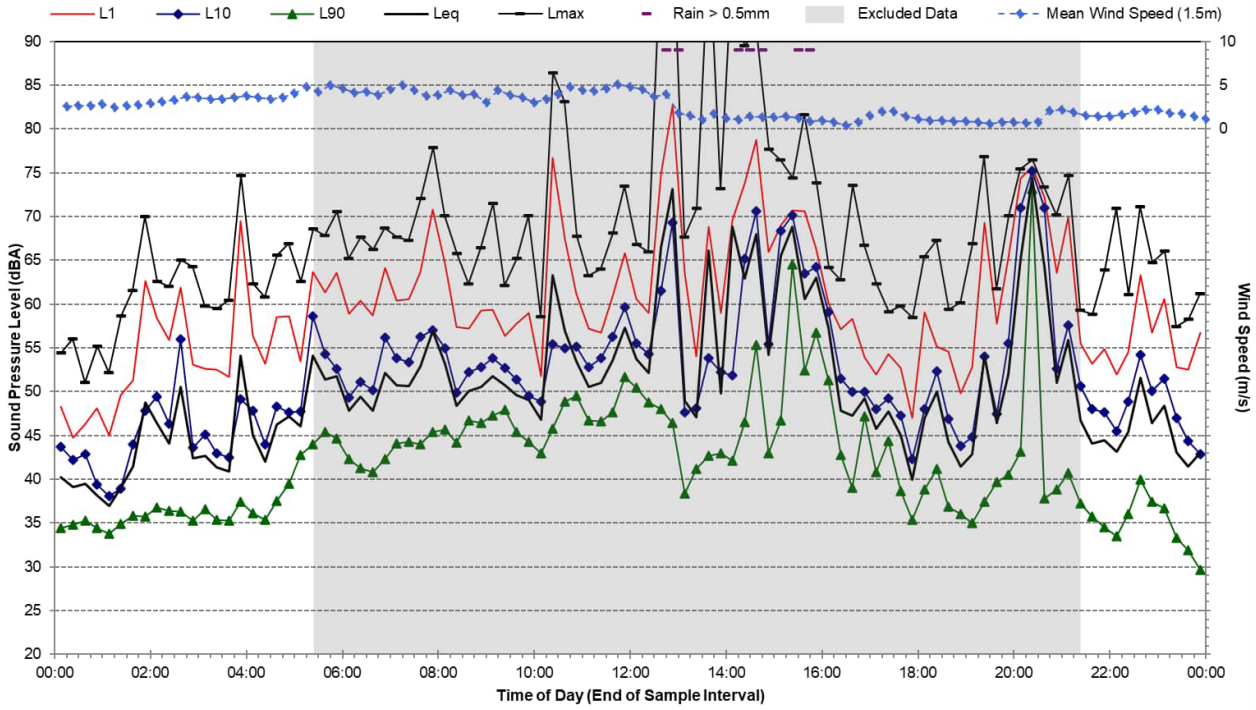
Statistical Ambient Noise Levels

L.02 - 1-3 Bland Street, Wallendbeen - Saturday, 16 November 2024



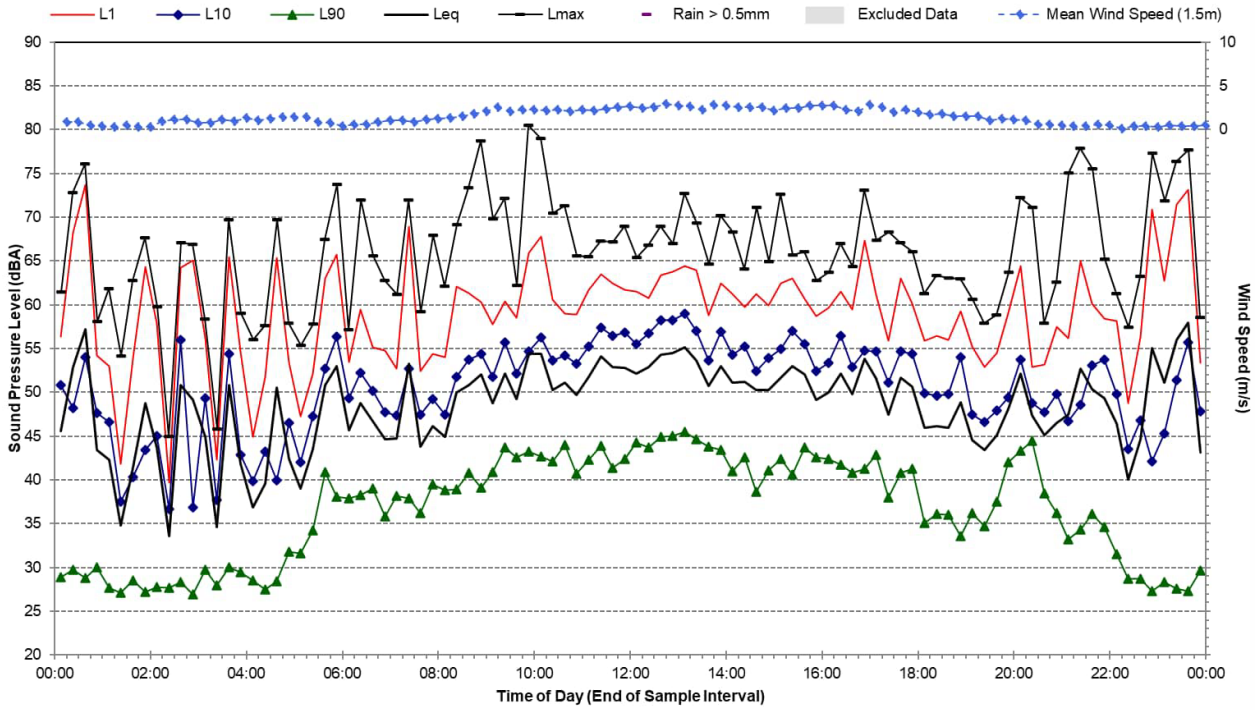
Statistical Ambient Noise Levels

L.02 - 1-3 Bland Street, Wallendbeen - Sunday, 17 November 2024



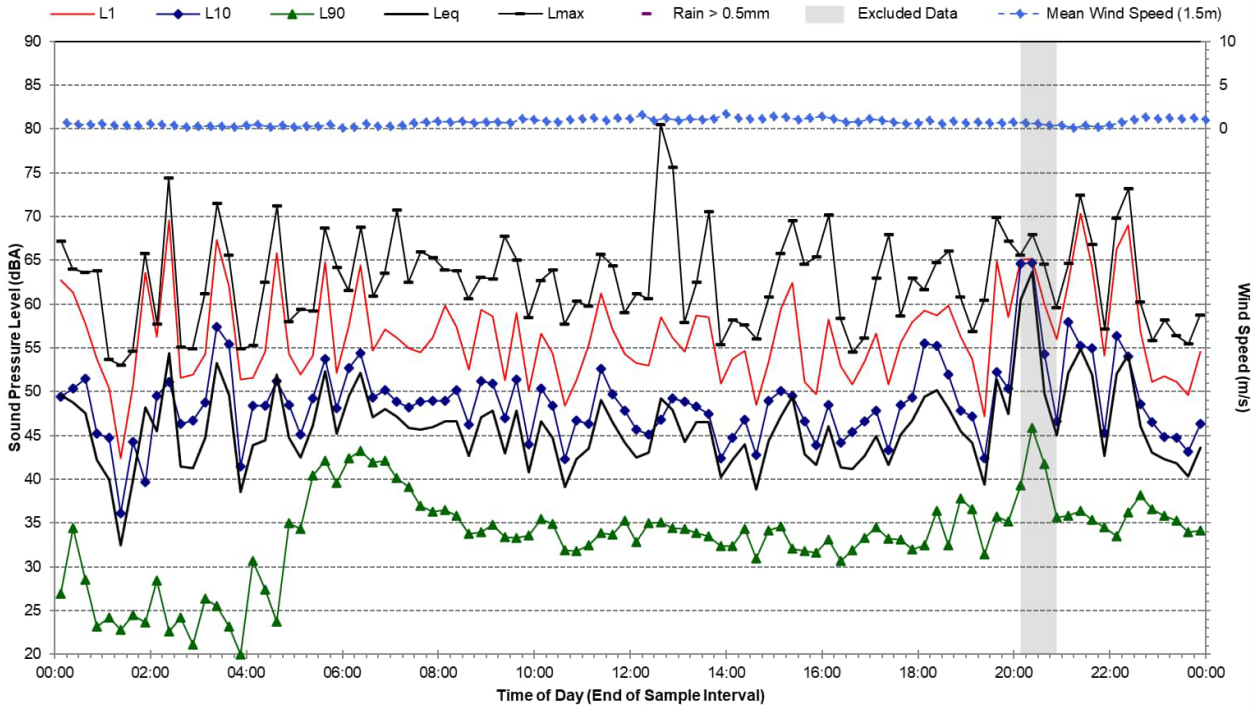
Statistical Ambient Noise Levels

L.02 - 1-3 Bland Street, Wallendbeen - Monday, 18 November 2024



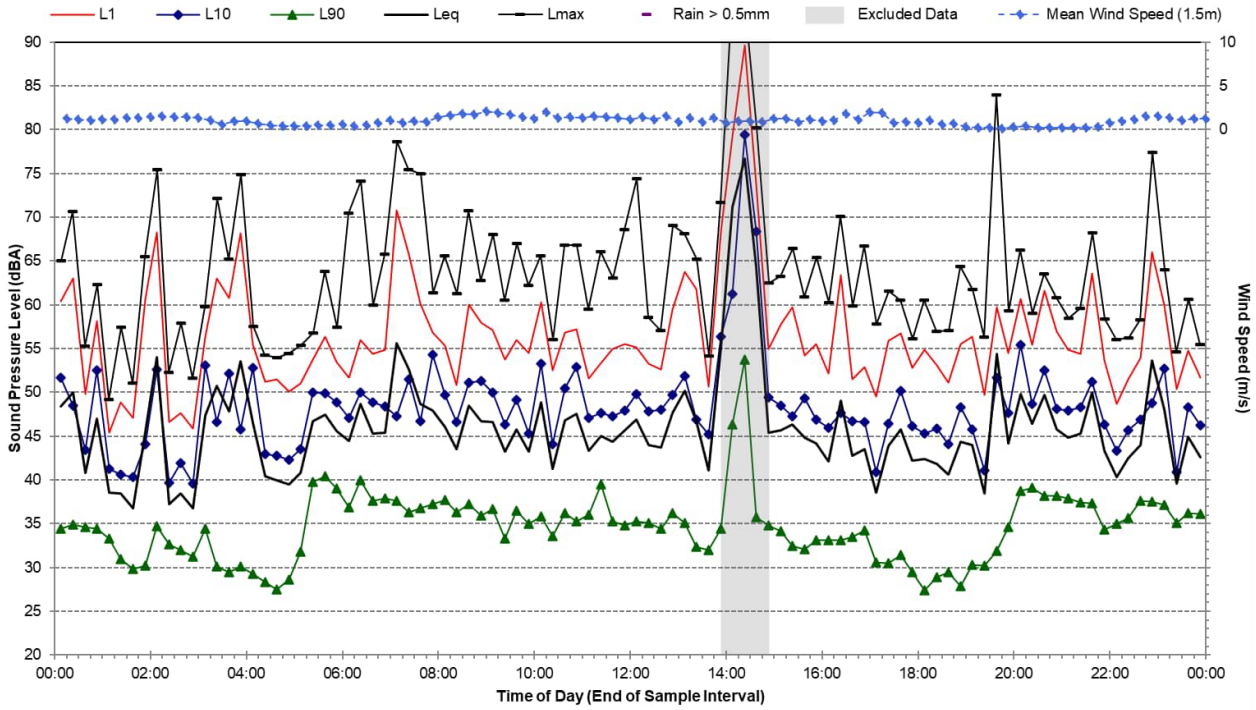
Statistical Ambient Noise Levels

L.02 - 1-3 Bland Street, Wallendbeen - Tuesday, 19 November 2024



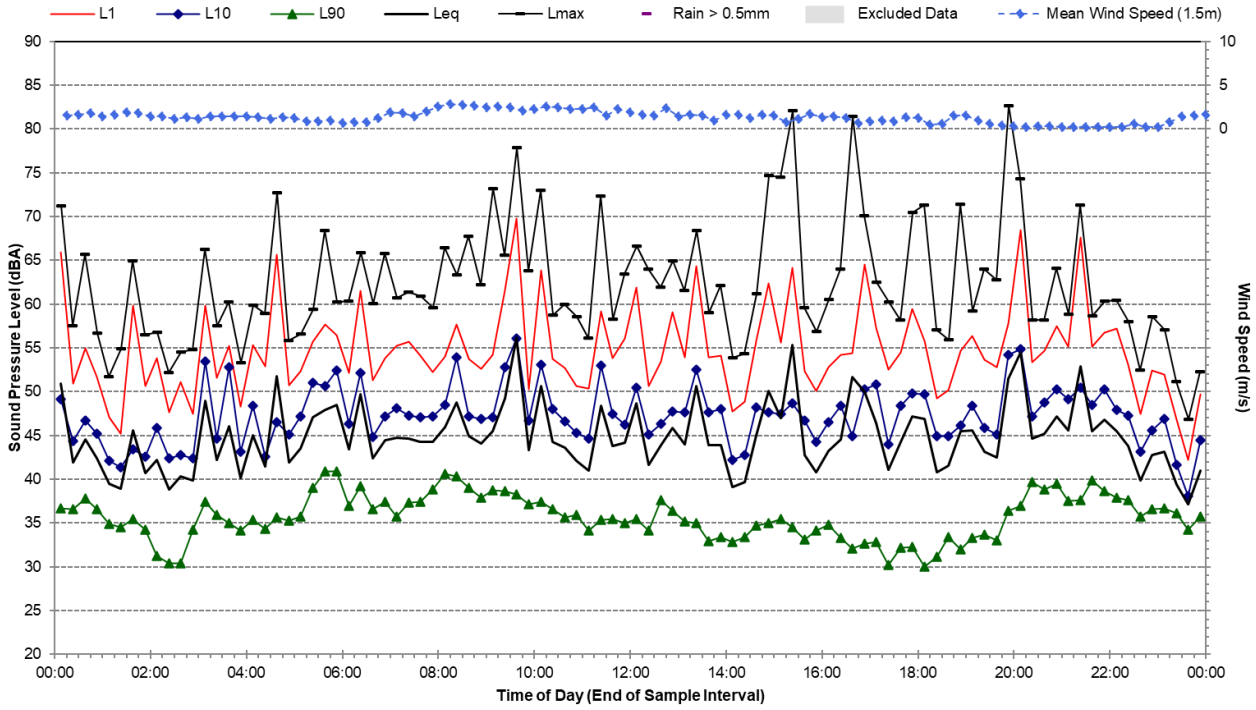
Statistical Ambient Noise Levels

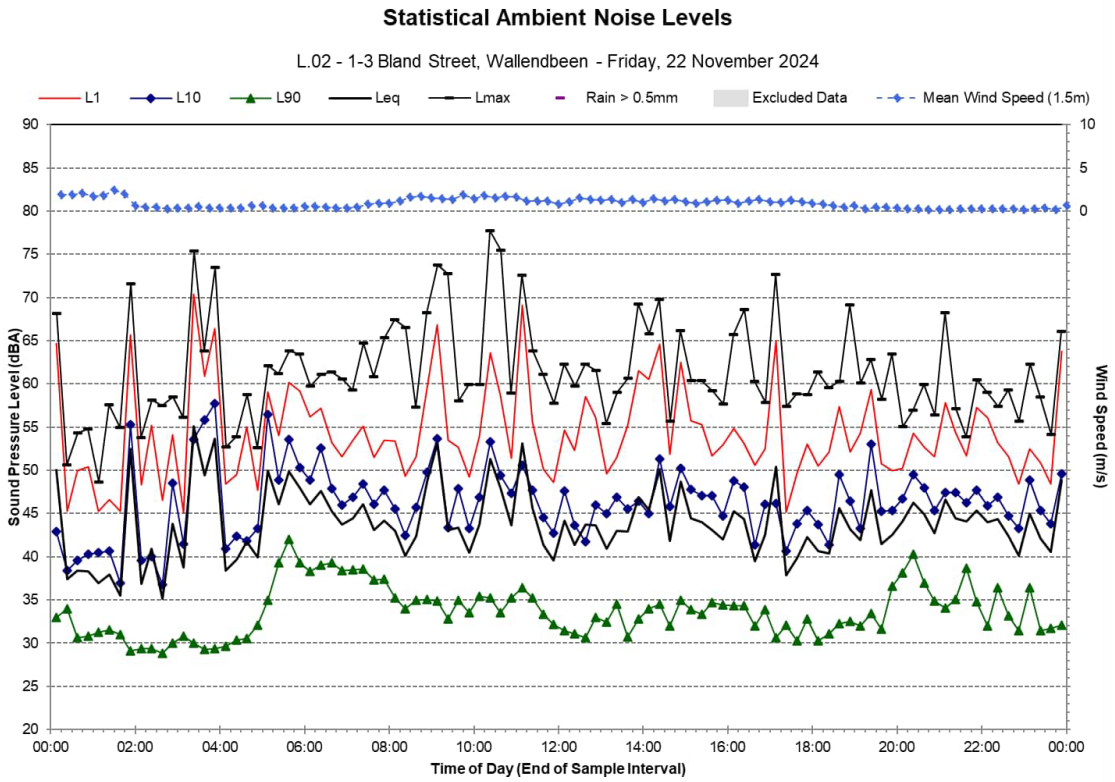
L.02 - 1-3 Bland Street, Wallendbeen - Wednesday, 20 November 2024

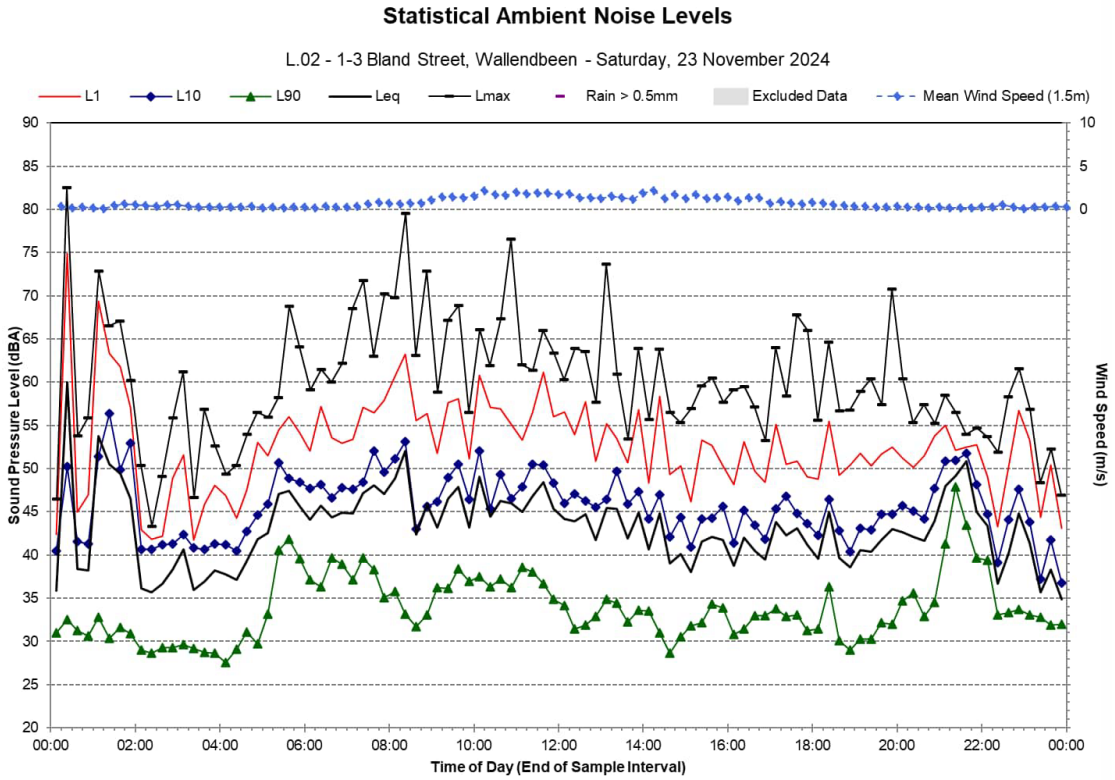


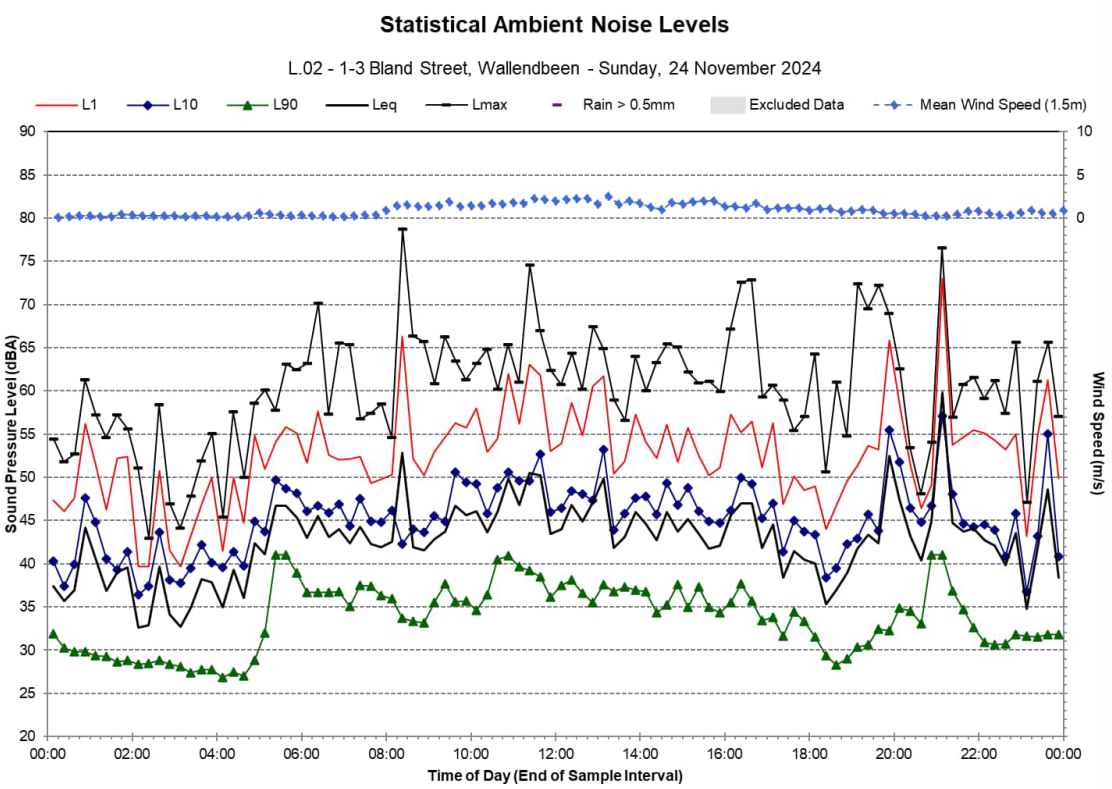
Statistical Ambient Noise Levels

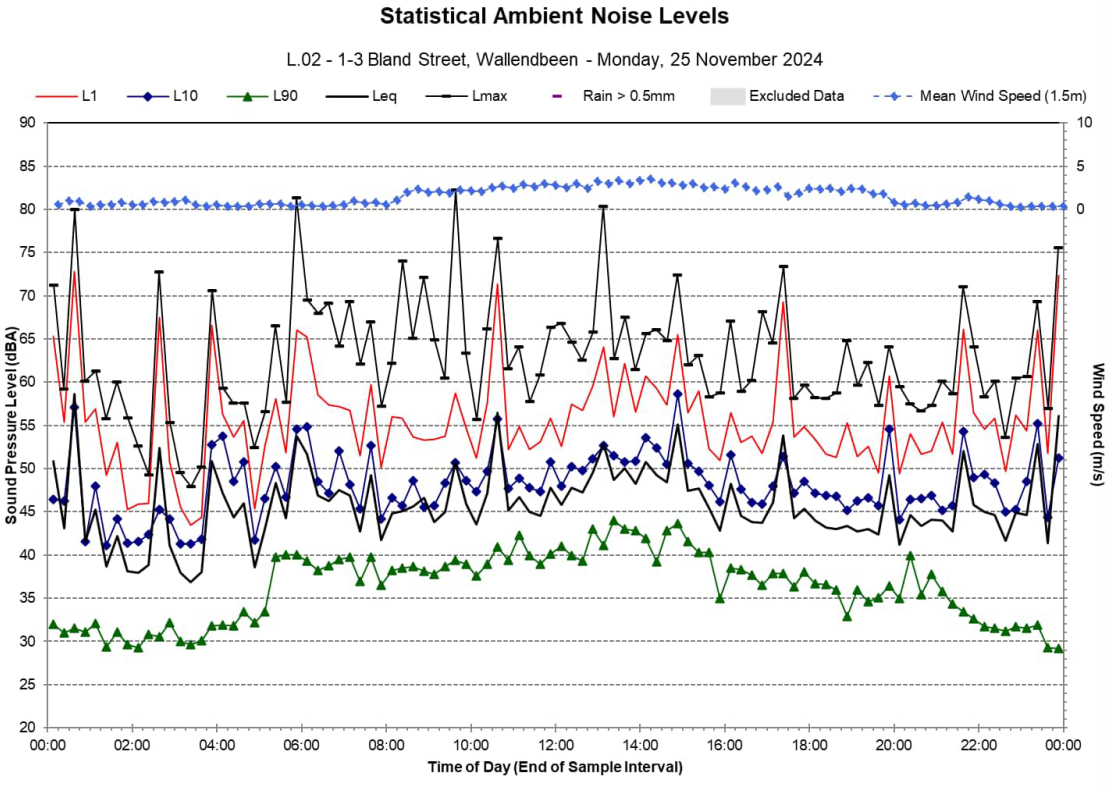
L.02 - 1-3 Bland Street, Wallendbeen - Thursday, 21 November 2024

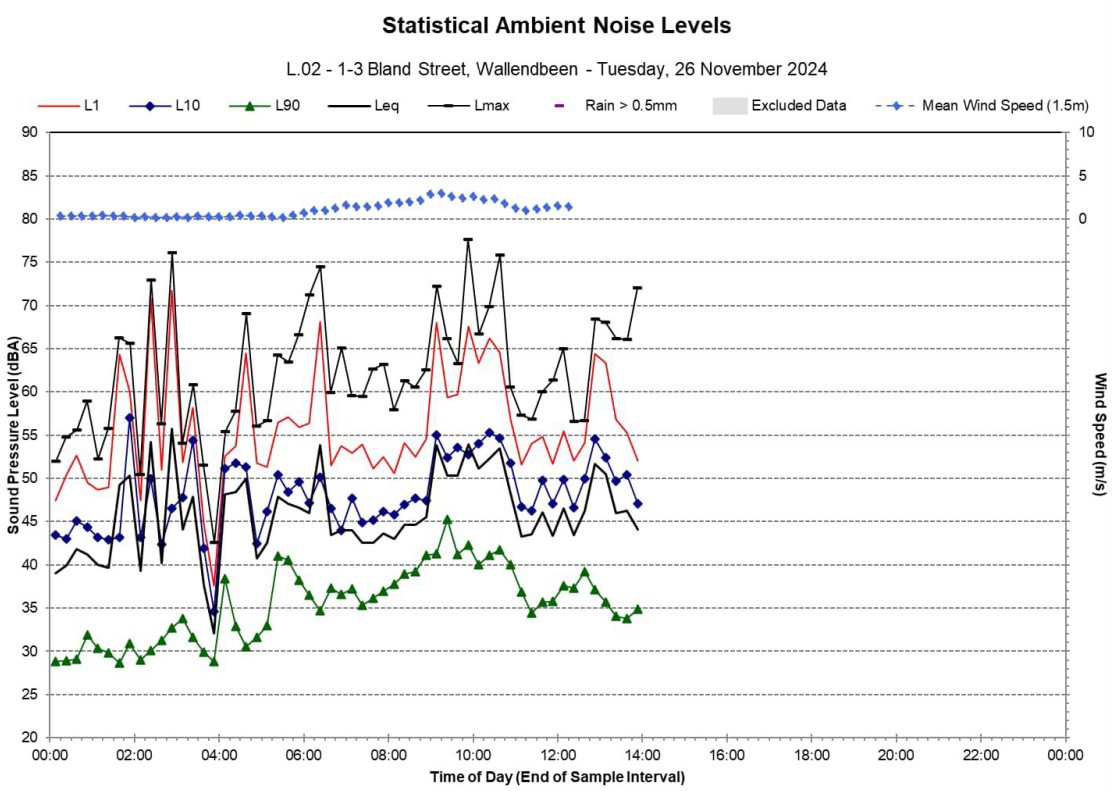



Statistical Ambient Noise Levels
L.02 - 1-3 Bland Street, Wallendbeen - Friday, 22 November 2024
L1
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L.02 - 1-3 Bland Street, Wallendbeen - Saturday, 23 November 2024
L1
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L.02 - 1-3 Bland Street, Wallendbeen - Sunday, 24 November 2024
L1
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L.02 - 1-3 Bland Street, Wallendbeen - Monday, 25 November 2024
L1
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L.02 - 1-3 Bland Street, Wallendbeen - Tuesday, 26 November 2024
L1
L10
L90
Leq
Lmax
Rain > 0.5mm
Excluded Data
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00

Appendix C Construction Information

Corridor Realignment and Replacement Bridge Over Rail at Wallendbeen

Noise and Vibration Impact Assessment

Transport for NSW

SLR Project No.: 610.032209.00001

30 January 2025

Equipment Lists and Sound Power Levels

Equipment		Total Sound Power Level (dBA)	Chainsaw[1]	Chipper	Compactor	Concrete Truck	Crane - Mobile (100t)	Excavator (20t)	Front End Loader	Grader	Hand Tools	Line Marking Truck	Roller - Vibratory[1]	Truck - Road Truck / Truck & Dog	Water Cart	Generator	Pavement Laying Machine	Pavement Profiler	Pneumatic Hammer[1]	Skidsteer Loader	Stump Grinder	Street Sweeper
Sound Power Level[2]			119	120	106	109	113	105	112	113	104	108	114	108	107	103	114	117	120	110	116	104
Estimated on-time in any 15 minutes			10	10	15	15	15	10	10	10	15	15	15	5	10	15	15	15	5	10	10	15
ID	**Activity**																					
W.01	Site Establishment and Early Work - Typical	116					X	X			X			X	X	X				X		
W.02	Site Establishment and Early Work - Peak	123	X	X			X	X			X		X	X	X	X				X	X	
W.03	Earthwork and Drainage - Typical	113						X			X			X	X	X				X		X
W.04	Earthwork and Drainage - Peak	118				X		X		X	X		X	X	X	X				X		X
W.05	Road Work - Typical	117			X	X		X	X		X			X	X	X				X		X
W.06	Road Work - Peak	122			X	X		X	X	X	X		X	X	X	X	X	X		X		X
W.07	Landscaping and Finishing Work - Typical	116				X		X			X	X		X	X	X				X		X
W.08	Landscaping and Finishing Work - Peak	120				X		X		X	X	X	X	X	X	X			X	X		X
W.09	Compounds and Stockpiles - Typical	115						X	X		X			X	X	X				X		X
W.10	Compounds - Peak	119					X	X	X		X			X	X	X			X	X		X

Note 1: Equipment classed as 'annoying' in the ICNG and requires a 5 dB correction.

Note 2: Sound power level data is taken from Transport's *Construction Noise and Vibration Strategy* (CNVG-R and CNVG-PTI), AS2436-2010 and DEFRA Noise Database.



Scale: Scale: 1:10,000
Coordinate System: GDA2020 / MGA zone 55

Drawn Date: 22-Jan-2025
Project Number: 610.032209

SLR

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W.01 - Site Establishment and Early Work - Typical

Standard Daytime Hours

APPENDIX C

H:\Projects-SLR\610-SnySYD\610.032209.00001 Wallendbeen Bridge N&V\06 SLR Data\05 Modelling\610.032209 Wallendbeen Bridge.qgz



0 250 500 m

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W.01 - Site Establishment and Early Work - Typical

Out of Hours Daytime

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W.01 - Site Establishment and Early Work - Typical

Out of Hours Evening

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W.01 - Site Establishment and Early Work - Typical

Out of Hours Night-time

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W.02 - Site Establishment and Early Work - Peak

Standard Daytime Hours

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W.02 - Site Establishment and Early Work - Peak

Out of Hours Daytime

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W.03 - Earthwork and Drainage - Typical

Standard Daytime Hours

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W.03 - Earthwork and Drainage - Typical

Out of Hours Daytime

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W.03 - Earthwork and Drainage - Typical

Out of Hours Evening

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0 250 500 m

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W.03 - Earthwork and Drainage - Typical

Out of Hours Night-time

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W.04 - Earthwork and Drainage - Peak

Standard Daytime Hours

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W.04 - Earthwork and Drainage - Peak

Out of Hours Daytime

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W.05 - Road Work - Typical

Standard Daytime Hours

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W.05 - Road Work - Typical

Out of Hours Daytime

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W.05 - Road Work - Typical

Out of Hours Evening

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W.05 - Road Work - Typical

Out of Hours Night-time

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W.06 - Road Work - Peak

Standard Daytime Hours

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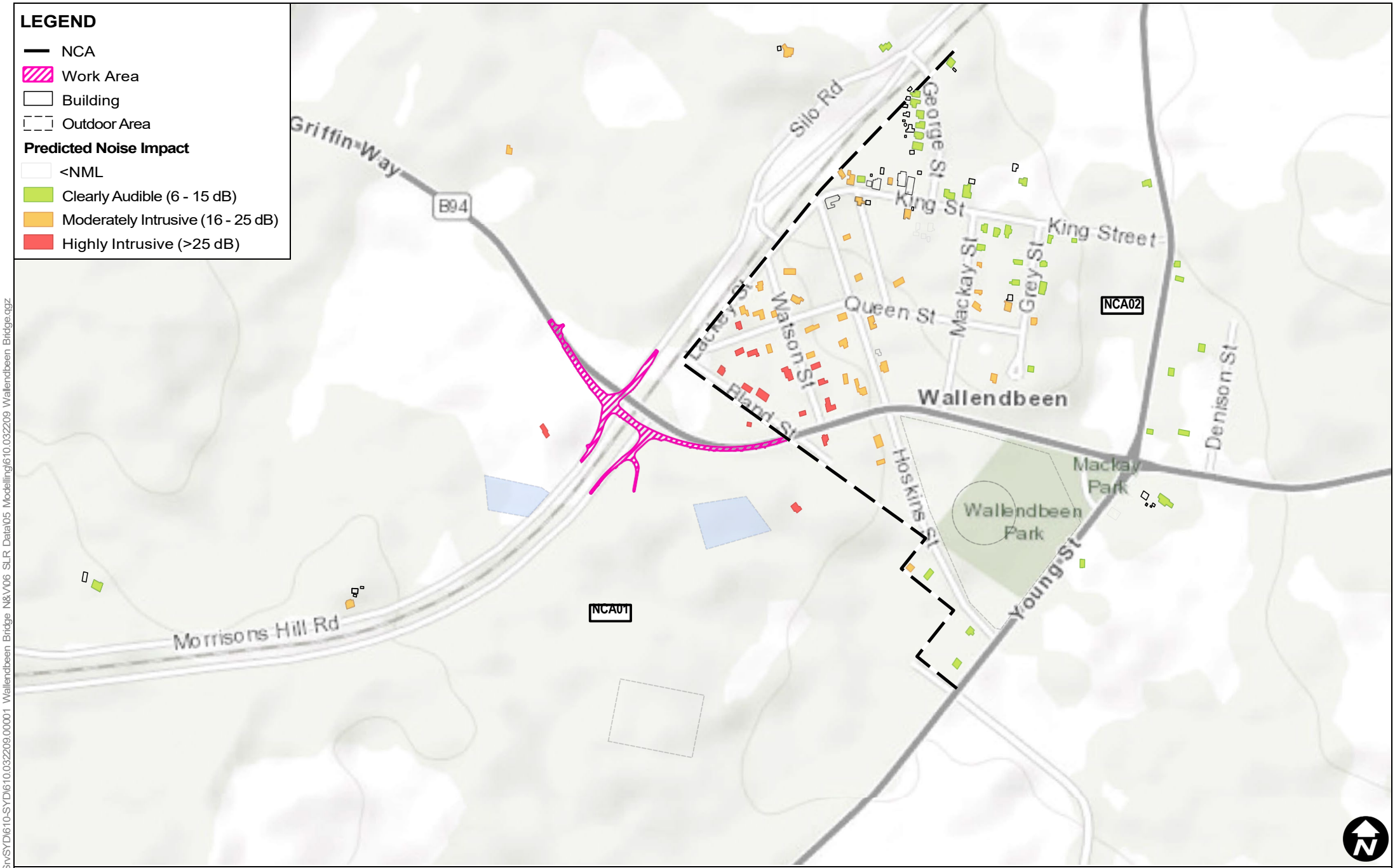
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W.06 - Road Work - Peak

Out of Hours Daytime

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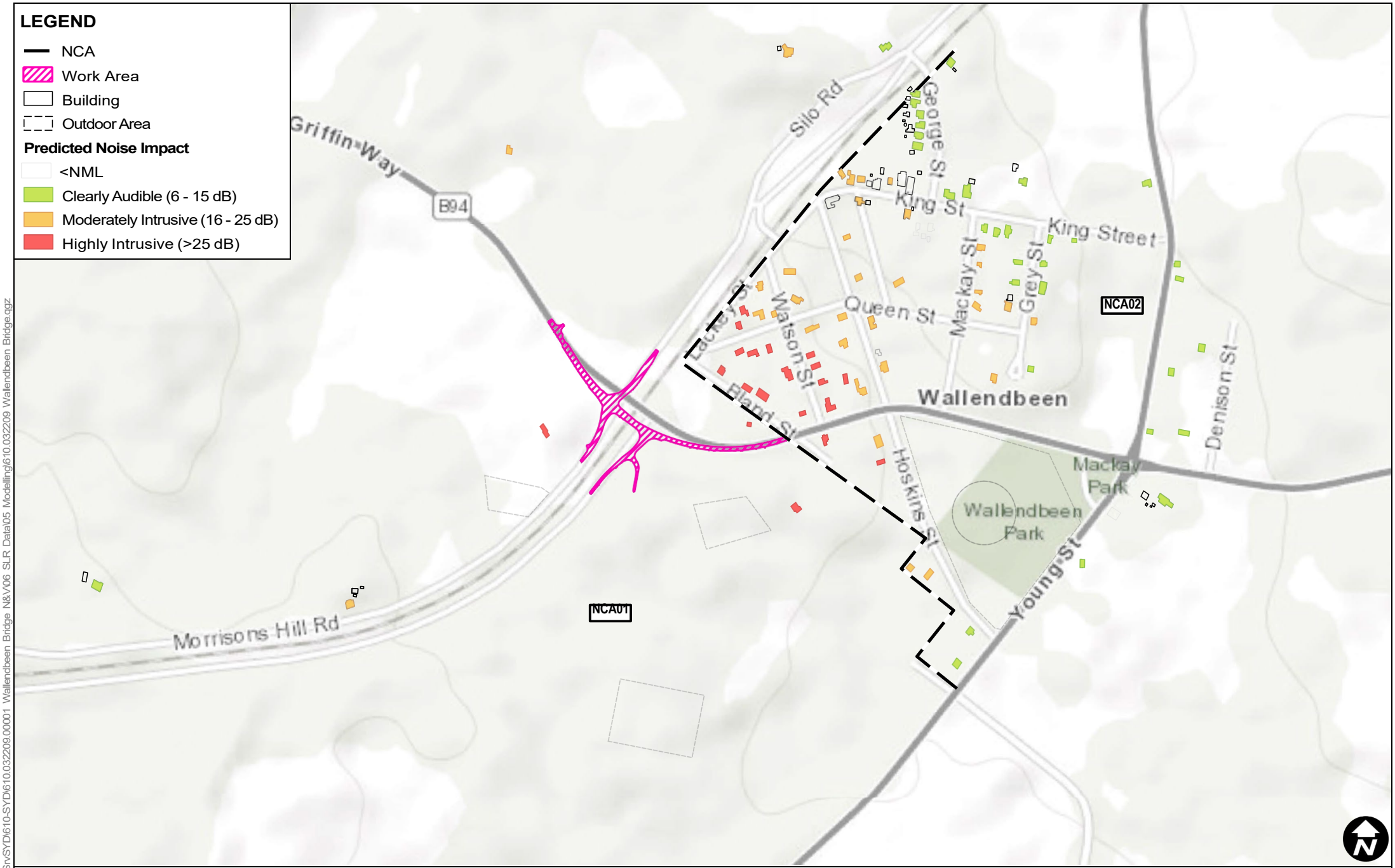
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W.06 - Road Work - Peak

Out of Hours Evening

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W.06 - Road Work - Peak

Out of Hours Night-time

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W.07 - Landscaping and Finishing Work - Typical

Standard Daytime Hours

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W.07 - Landscaping and Finishing Work - Typical

Out of Hours Daytime

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W.07 - Landscaping and Finishing Work - Typical

Out of Hours Evening

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W.07 - Landscaping and Finishing Work - Typical

Out of Hours Night-time

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W.08 - Landscaping and Finishing Work - Peak

Standard Daytime Hours

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Scale: Scale: 1:10,000
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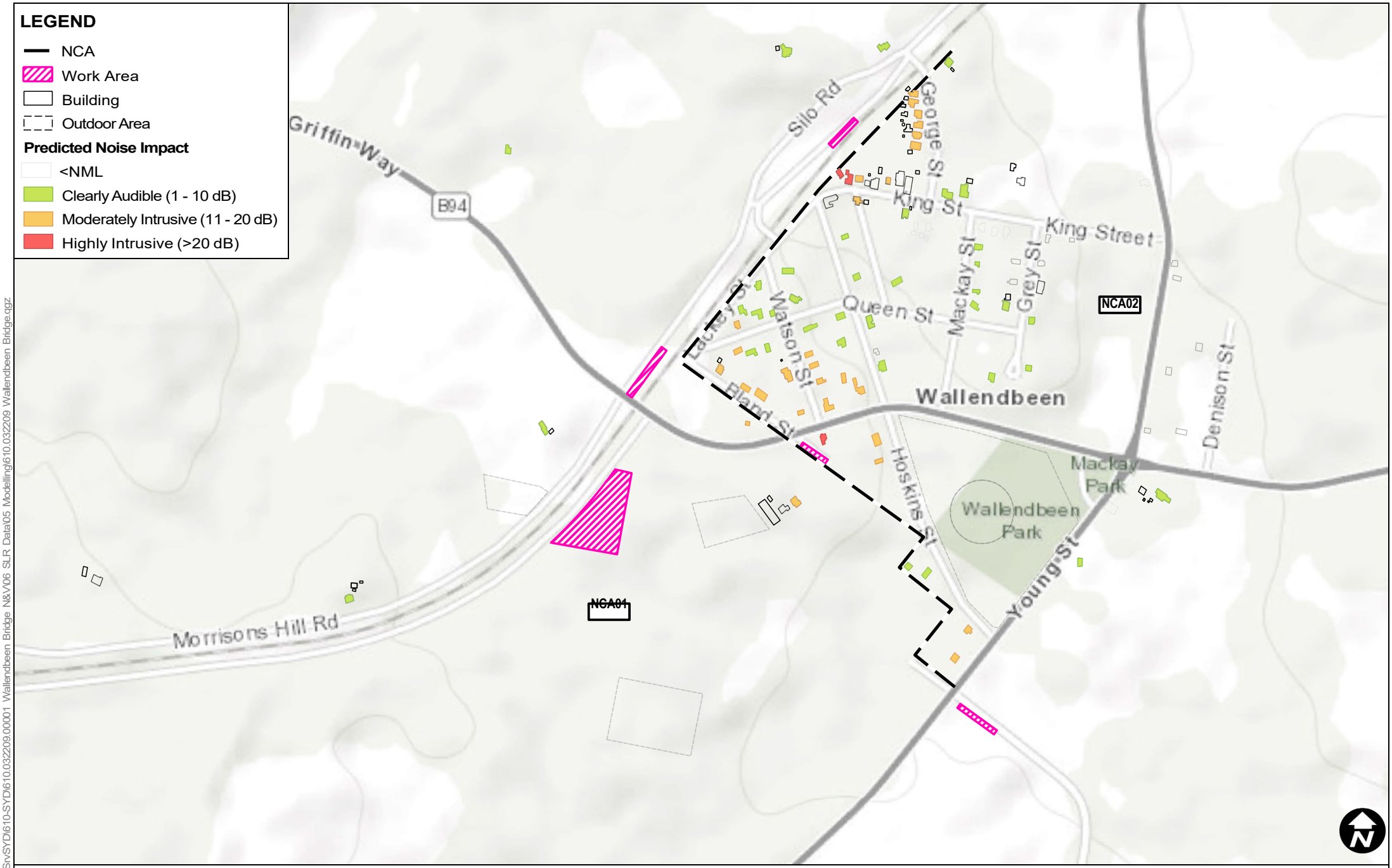
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W.08 - Landscaping and Finishing Work - Peak

Out of Hours Daytime

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W.09 - Compounds and Stockpiles - Typical

Standard Daytime Hours

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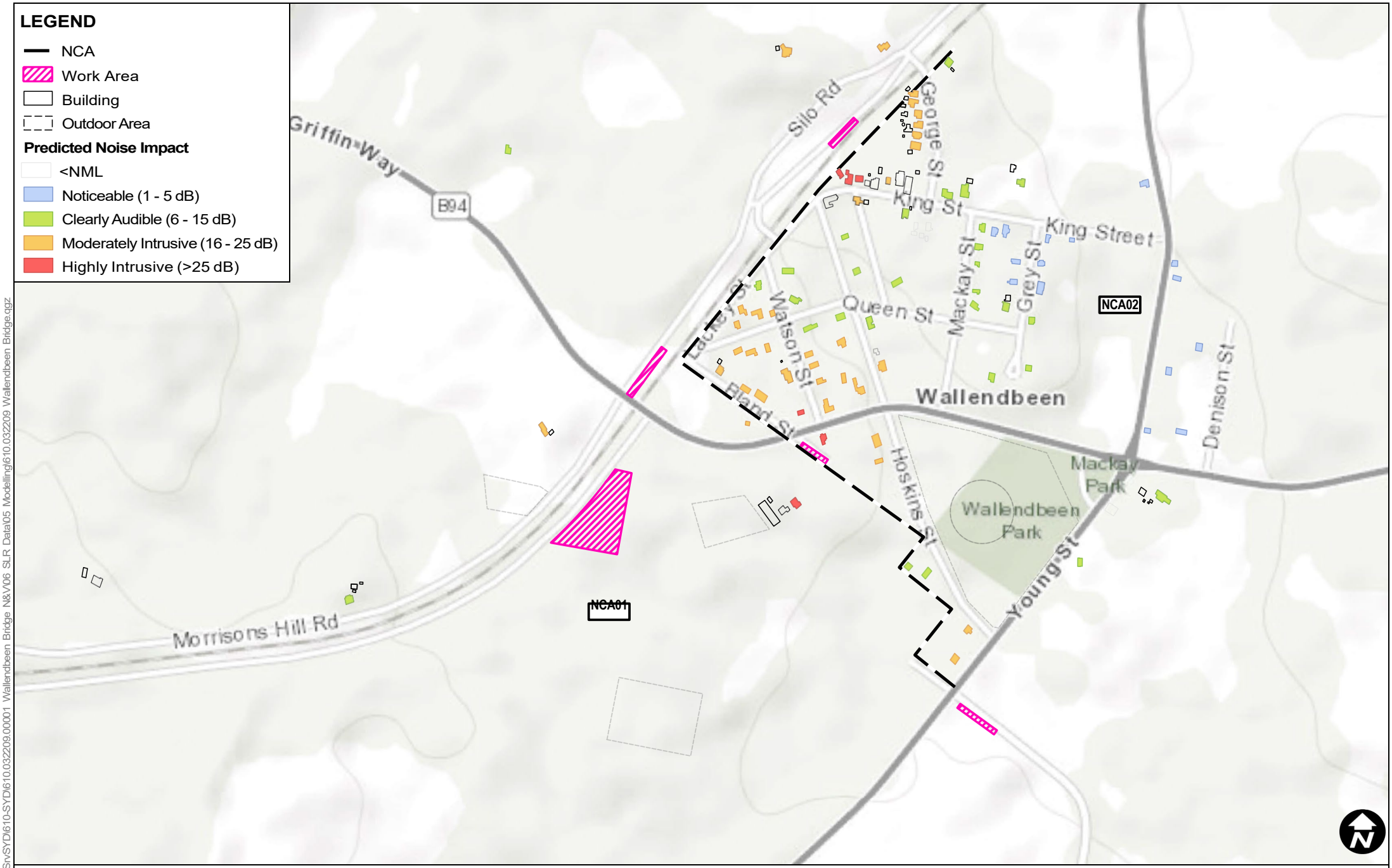
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W.09 - Compounds and Stockpiles - Typical

Out of Hours Daytime

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Project Number: 610.032209

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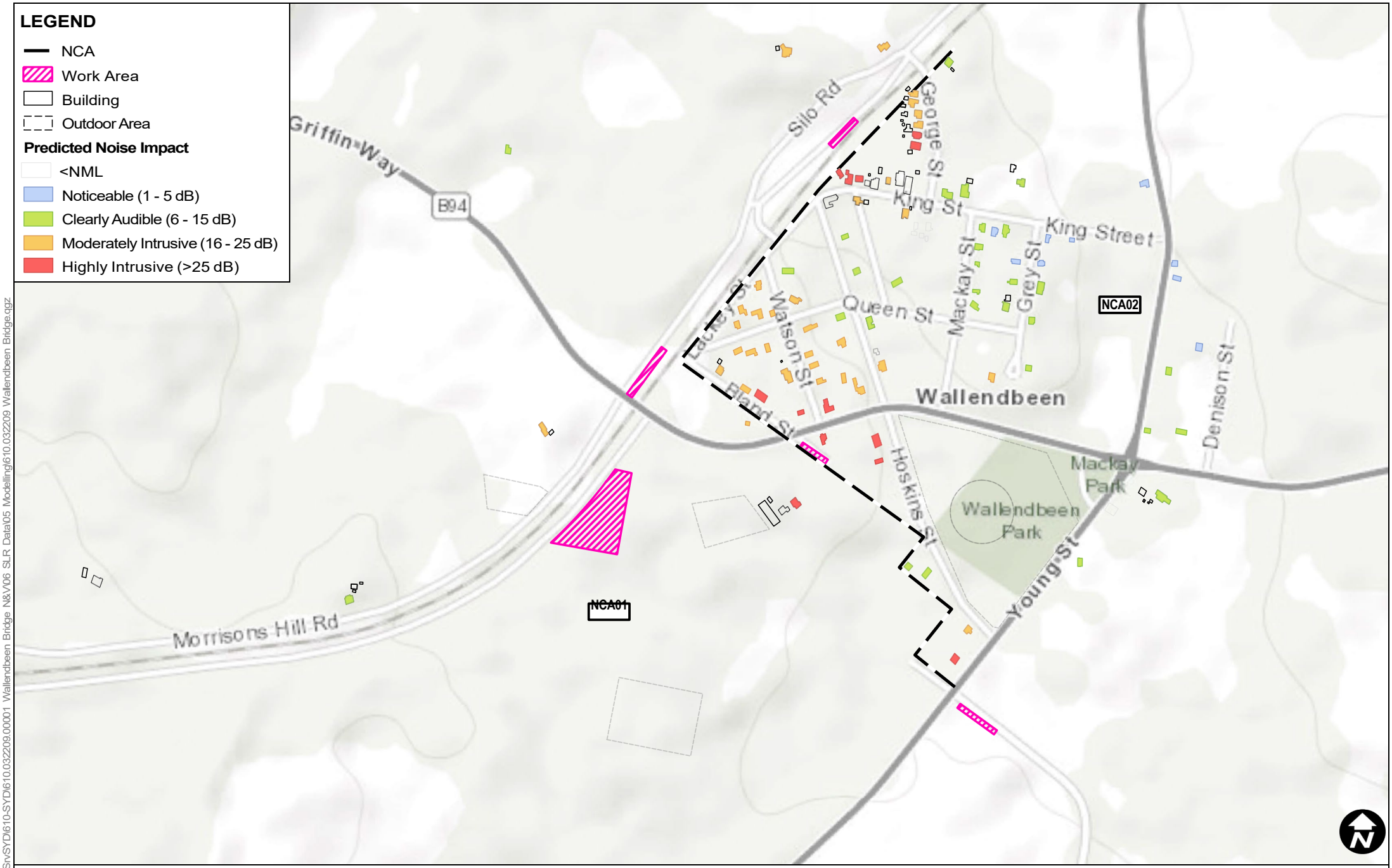
SLR

DISCLAIMER: All information within this document may be based on external sources.
SLR Consulting Pty Ltd makes no warranty regarding the data's accuracy or reliability for any purpose.

W.09 - Compounds and Stockpiles - Typical

Out of Hours Evening

APPENDIX C



Scale: Scale: 1:10,000
Coordinate System: GDA2020 / MGA zone 55

Drawn Date: 22-Jan-2025
Project Number: 610.032209

H:\Projects-SLR\610-SnySYD\610.032209.00001 Wallendbeen Bridge N&V\06 SLR Data\05 Modelling\610.032209 Wallendbeen Bridge.qgz

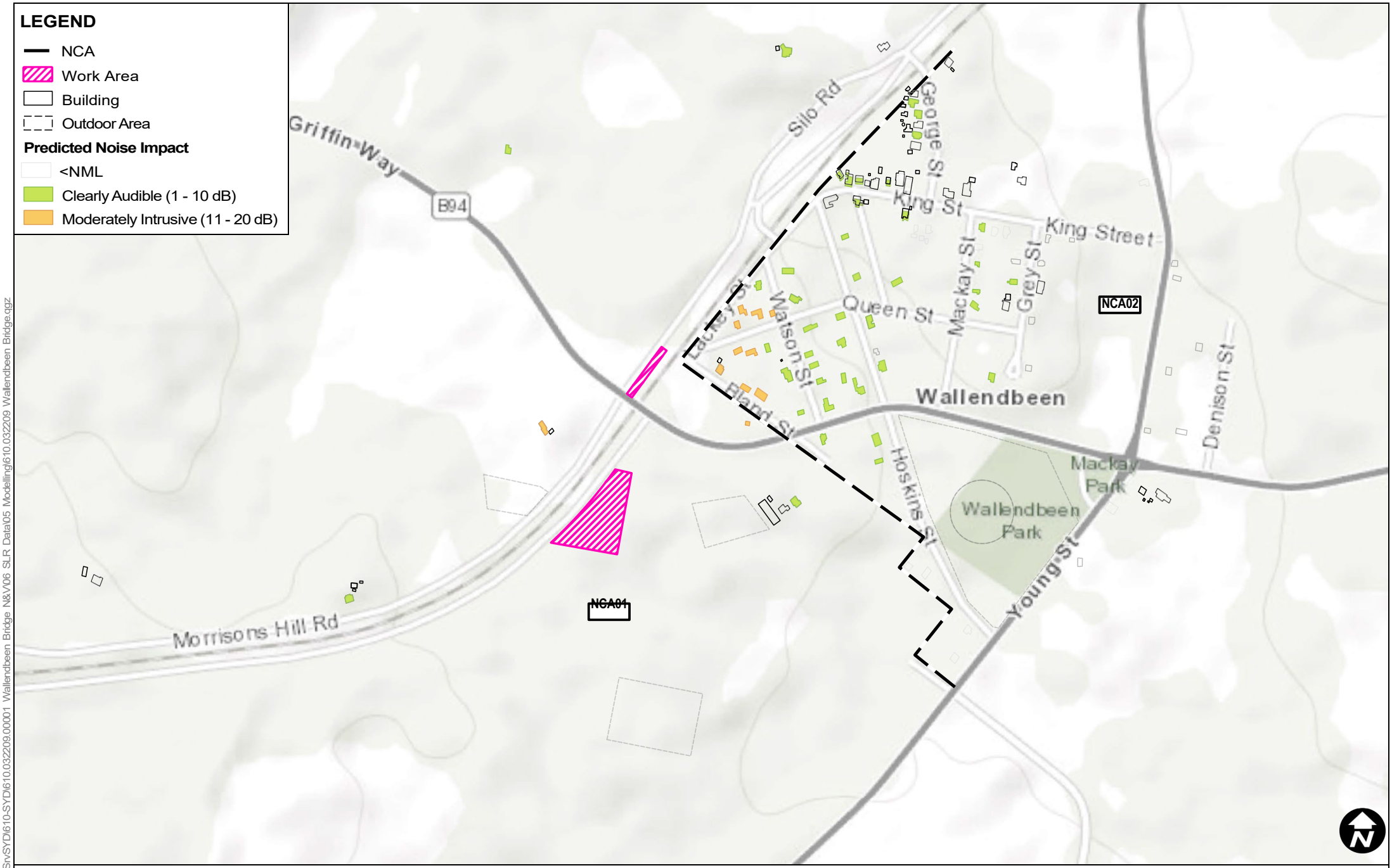
SLR

DISCLAIMER: All information within this document may be based on external sources.
SLR Consulting Pty Ltd makes no warranty regarding the data's accuracy or reliability for any purpose.

W.09 - Compounds and Stockpiles - Typical

Out of Hours Night-time

APPENDIX C



Scale: Scale: 1:10,000
Coordinate System: GDA2020 / MGA zone 55

Drawn Date: 22-Jan-2025
Project Number: 610.032209

SLR

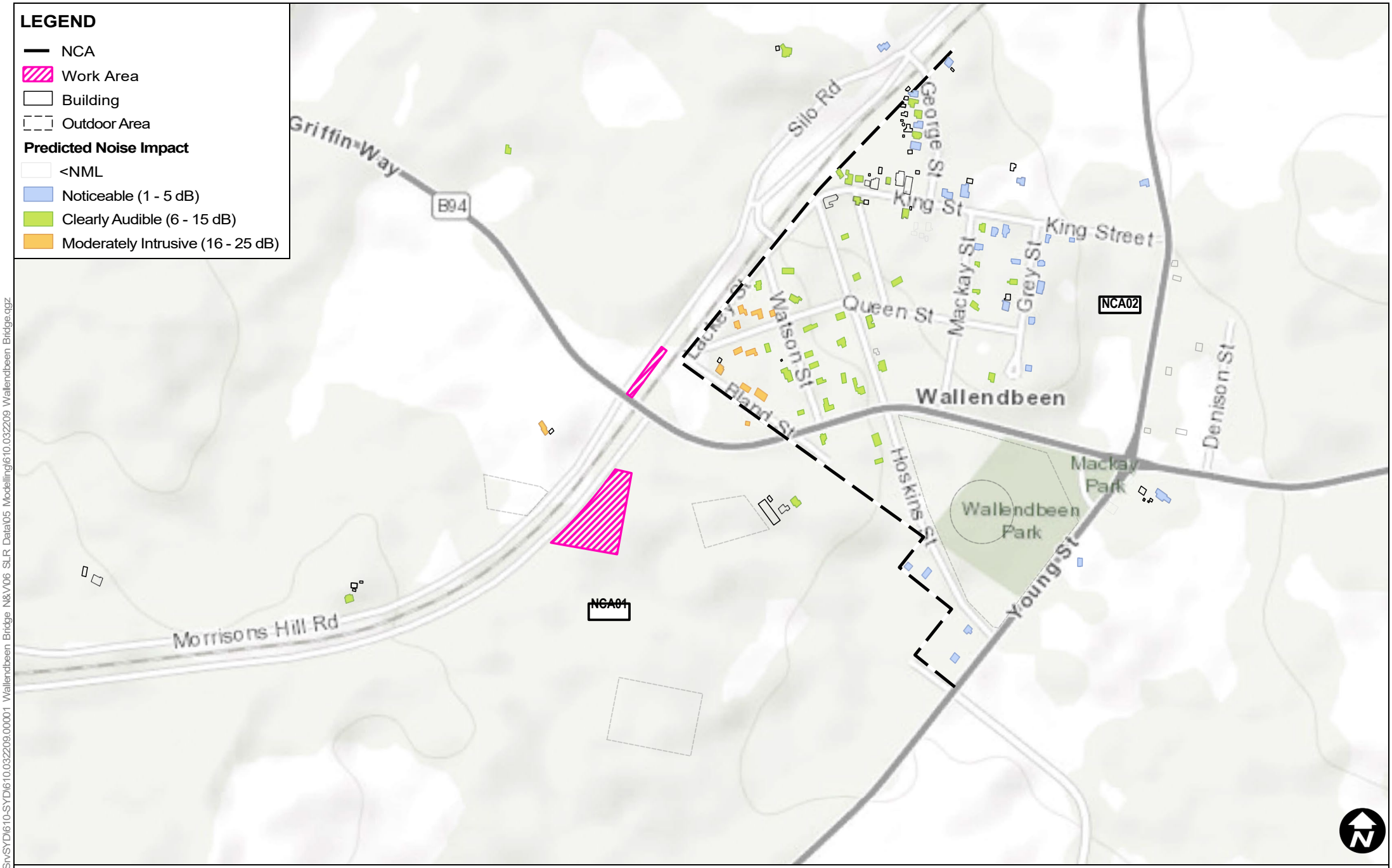
DISCLAIMER: All information within this document may be based on external sources.
SLR Consulting Pty Ltd makes no warranty regarding the data's accuracy or reliability for any purpose.

W.10 - Compounds - Peak

Standard Daytime Hours

APPENDIX C

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0 250 500 m

Scale: Scale: 1:10,000
Coordinate System: GDA2020 / MGA zone 55

Drawn Date: 22-Jan-2025
Project Number: 610.032209

SLR

DISCLAIMER: All information within this document may be based on external sources.
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W.10 - Compounds - Peak

Out of Hours Daytime

APPENDIX C

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CNVG Standard Mitigation and Management Measures

Action Required	Applies To	Details
Management measures		
Implementation of any project specific mitigation measures required.	Airborne noise	Implementation of any project specific mitigation measures required.
Implement community consultation or notification measures.	Airborne noise Ground-borne noise and vibration	Notification detailing work activities, dates and hours, impacts and mitigation measures, indication of work schedule over the night time period, any operational noise benefits from the works (where applicable) and contact telephone number. Notification should be a minimum of 7 calendar days prior to the start of works. For projects other than maintenance works more advanced consultation or notification may be required. Please contact Roads and Maritime Communication and Stakeholder Engagement for guidance. Website (If required) Contact telephone number for community Email distribution list (if required) Community drop in session (if required by approval conditions).
Site inductions	Airborne noise Ground-borne noise and vibration	All employees, contractors and subcontractors are to receive an environmental induction. The induction must at least include: • all project specific and relevant standard noise and vibration mitigation measures • relevant licence and approval conditions • permissible hours of work • any limitations on high noise generating activities • location of nearest sensitive receivers • construction employee parking areas • designated loading/unloading areas and procedures • site opening/closing times (including deliveries) • environmental incident procedures.
Behavioural practices	Airborne noise	No swearing or unnecessary shouting or loud stereos/radios on site. No dropping of materials from height, throwing of metal items and slamming of doors.
Verification	Airborne noise Ground-borne noise and vibration	Where specified under Appendix C of the CNVG a noise verification program is to be carried out for the duration of the works in accordance with the Construction Noise and Vibration Management Plan and any approval and licence conditions.
Attended vibration measurements	Ground-borne vibration	Where required attended vibration measurements should be undertaken at the commencement of vibration generating activities to confirm that vibration levels are within the acceptable range to prevent cosmetic building damage.
Update Construction Environmental Management Plans	Airborne noise Ground-borne noise and vibration	The CEMP must be regularly updated to account for changes in noise and vibration management issues and strategies.
Building condition surveys	Vibration Blasting	Undertake building dilapidation surveys on all buildings located within the buffer zone prior to commencement of activities with the potential to cause property damage

Action Required	Applies To	Details
Source controls		
Construction hours and scheduling	Airborne noise Ground-borne noise and vibration	Where feasible and reasonable, construction should be carried out during the standard daytime working hours. Work generating high noise and/or vibration levels should be scheduled during less sensitive time periods.
Construction respite period during normal hours and out-of-hours work	Ground-borne noise and vibration Airborne noise	See Appendix C of the CNVG for more details on the following respite measures: • Respite Offers (RO) • Respite Period 1 (R1) • Respite Period 2 (R2) • Duration Respite (DR)
Equipment selection.	Airborne noise Ground-borne noise and vibration	Use quieter and less vibration emitting construction methods where feasible and reasonable. For example, when piling is required, bored piles rather than impact-driven piles will minimise noise and vibration impacts. Similarly, diaphragm wall construction techniques, in lieu of sheet piling, will have significant noise and vibration benefits. Ensure plant including the silencer is well maintained.
Plant noise levels.	Airborne-noise	The noise levels of plant and equipment must have operating Sound Power or Sound Pressure Levels compliant with the criteria in Appendix H of the CNVG. Implement a noise monitoring audit program to ensure equipment remains within the more stringent of the manufacturers specifications or Appendix H of the CNVG.
Rental plant and equipment.	Airborne-noise	The noise levels of plant and equipment items are to be considered in rental decisions and in any case cannot be used on site unless compliant with the criteria in Table 2 of the CNVG.
Use and siting of plant.	Airborne-noise	The offset distance between noisy plant and adjacent sensitive receivers is to be maximised. Plant used intermittently to be throttled down or shut down. Noise-emitting plant to be directed away from sensitive receivers. Only have necessary equipment on site.
Plan worksites and activities to minimise noise and vibration.	Airborne noise Ground-borne vibration	Locate compounds away from sensitive receivers and discourage access from local roads. Plan traffic flow, parking and loading/unloading areas to minimise reversing movements within the site. Where additional activities or plant may only result in a marginal noise increase and speed up works, consider limiting duration of impact by concentrating noisy activities at one location and move to another as quickly as possible. Very noise activities should be scheduled for normal working hours. If the work can not be undertaken during the day, it should be completed before 11:00pm. Where practicable, work should be scheduled to avoid major student examination periods when students are studying for examinations such as before or during Higher School Certificate and at the end of higher education semesters. If programmed night work is postponed the work should be re-programmed and the approaches in this guideline apply again.
Reduced equipment power	Airborne noise Ground-borne vibration	Use only the necessary size and power.

Action Required	Applies To	Details
Non-tonal and ambient sensitive reversing alarms	Airborne noise	Non-tonal reversing beepers (or an equivalent mechanism) must be fitted and used on all construction vehicles and mobile plant regularly used on site and for any out of hours work. Consider the use of ambient sensitive alarms that adjust output relative to the ambient noise level.
Minimise disturbance arising from delivery of goods to construction sites.	Airborne noise	Loading and unloading of materials/deliveries is to occur as far as possible from sensitive receivers. Select site access points and roads as far as possible away from sensitive receivers. Dedicated loading/unloading areas to be shielded if close to sensitive receivers. Delivery vehicles to be fitted with straps rather than chains for unloading, wherever possible. Avoid or minimise these out of hours movements where possible.
Engine compression brakes	Construction vehicles	Limit the use of engine compression brakes at night and in residential areas. Ensure vehicles are fitted with a maintained Original Equipment Manufacturer exhaust silencer or a silencer that complies with the National Transport Commission's 'In-service test procedure' and standard.
Path controls		
Shield stationary noise sources such as pumps, compressors, fans etc.	Airborne noise	Stationary noise sources should be enclosed or shielded where feasible and reasonable whilst ensuring that the occupational health and safety of workers is maintained. Appendix D of AS 2436:2010 lists materials suitable for shielding.
Shield sensitive receivers from noisy activities.	Airborne noise	Use structures to shield residential receivers from noise such as site shed placement; earth bunds; fencing; erection of operational stage noise barriers (where practicable) and consideration of site topography when situating plant.
Receptor control		
Structural surveys and vibration monitoring	Ground-borne vibration	Pre-construction surveys of the structural integrity of vibration sensitive buildings may be warranted. At locations where there are high-risk receptors, vibration monitoring should be conducted during the activities causing vibration.
See Appendix C of the CNVG for additional measures	Airborne noise Ground-borne vibration	In some instances additional mitigation measures may be required.

Table 1 CNVG 'Additional Mitigation Measures'

Additional Mitigation Measure	Description
Notification (letterbox drop or equivalent)	Advanced warning of works and potential disruptions can assist in reducing the impact on the community. The notification may consist of a letterbox drop (or equivalent) detailing work activities, time periods over which these will occur, impacts and mitigation measures. Notification should be a minimum of five working days prior to the start of works.
Specific notifications (SN)	Specific notifications are letterbox dropped (or equivalent) to identified stakeholders no later than seven calendar days ahead of construction activities that are likely to exceed the noise objectives. The specific notification provides additional information when relevant and informative to more highly affected receivers than covered in general letterbox drops.
Phone calls (PC)	Phone calls detailing relevant information made to affected stakeholders within seven calendar days of proposed work. Phone calls provide affected stakeholders with personalised contact and tailored advice, with the opportunity to provide comments on the proposed work and specific needs.
Individual briefings (IB)	Individual briefings are used to inform stakeholders about the impacts of high noise activities and mitigation measures that will be implemented. Project representatives would visit identified stakeholders at least 48 hours ahead of potentially disturbing construction activities. Individual briefings provide affected stakeholders with personalised contact and tailored advice, with the opportunity to comment on the project.
Respite Offers (RO)	Respite Offers should be considered where there are high noise and vibration generating activities near receivers. As a guide work should be carried out in continuous blocks that do not exceed three hours each, with a minimum respite period of one hour between each block. The actual duration of each block of work and respite should be flexible to accommodate the usage of and amenity at nearby receivers. The purpose of such an offer is to provide residents with respite from an ongoing impact. This measure is evaluated on a project-by-project basis, and may not be applicable to all projects.
Respite Period 1 (R1)	Out of hours construction noise in 'out of hours period 1' shall be limited to no more than three consecutive evenings per week except where there is a Duration Respite. For night work these periods of work should be separated by not less than one week and no more than six evenings per month.
Respite Period 2 (R2)	Night time construction noise in 'out of hours period 2' shall be limited to two consecutive nights except for where there is a Duration Respite. For night work these periods of work should be separated by not less than one week and six nights per month. Where possible, high noise generating works shall be completed before 11pm.
Duration Respite (DR)	Respite offers and respite periods 1 and 2 may be counterproductive in reducing the impact on the community for longer duration projects. In this instance and where it can be strongly justified it may be beneficial to increase the work duration, number of evenings or nights worked through Duration Respite so that the project can be completed more quickly. The project team should engage with the community where noise levels are expected to exceed the NML to demonstrate support for Duration Respite.
Alternative Accommodation (AA)	Alternative accommodation may be offered to residents living in close proximity to construction works that are likely to experience highly intrusive noise levels. The specifics of the offer should be identified on a project-by-project basis. Additional aspects for consideration shall include whether the highly intrusive activities occur throughout the night or before midnight.
Verification (V)	Verification of construction noise and vibration levels should occur to ensure the actual impacts are consistent with the predicted levels. Appendix F of the CNVG contains further details about verification of Noise and Vibration levels as part of routine checks of noise levels or following reasonable complaints.

Appendix D Operational Information

Corridor Realignment and Replacement Bridge Over Rail at Wallendbeen

Noise and Vibration Impact Assessment

Transport for NSW

SLR Project No.: 610.032209.00001

30 January 2025

Traffic Volumes

Table 1 Annual Average Traffic Growth

Station ID	Location	Years	Average Annual Growth[1]
HHW006	Hume Highway East of Yass	2010 - 2024	2.4%
6135	Hume Highway West of Yass	2015 - 2024	2.5%
6139	Hume Highway North of Coolac	2015 - 2024	2.7%
6143	Newel Highway east of West Wyalong	2015 - 2024	0.3%
94077	Olympic Highway North of Wallendbeen	2006, 2010, 2012	1.1%
94514	Burley Griffin Way west of Wallendbeen	2006, 2010, 2012	5.4%
94344	Albury Street in Harden	2006, 2010, 2012	4.3%
		Average	**2.7%**

Note: Average traffic growth calculated based on the average annual increase across the available count period. The average excludes 2020 and 2021, which exhibited atypical declines in traffic due to COVID-19 restrictions.

Table 2 Existing Traffic Volumes – Validation 2024

Road	Direction	Validation Traffic Volumes			
		15 Hour Daytime (0700-2200)		9 Hour Night-time (2200-0700)	
		Light Vehicles	Heavy Vehicles	Light Vehicles	Heavy Vehicles
Burley Griffin Way	EB	376	161	23	25
	WB	363	161	22	34
Olympic Highway	NB	960	322	77	40
	SB	962	322	90	51

Note: Validation of the noise model was completed using data from 9 to 21 November 2024, excluding the daytime period of 16 November and the night-time period of 17 November due to adverse weather.

Table 3 Estimated Traffic Volumes – 2025

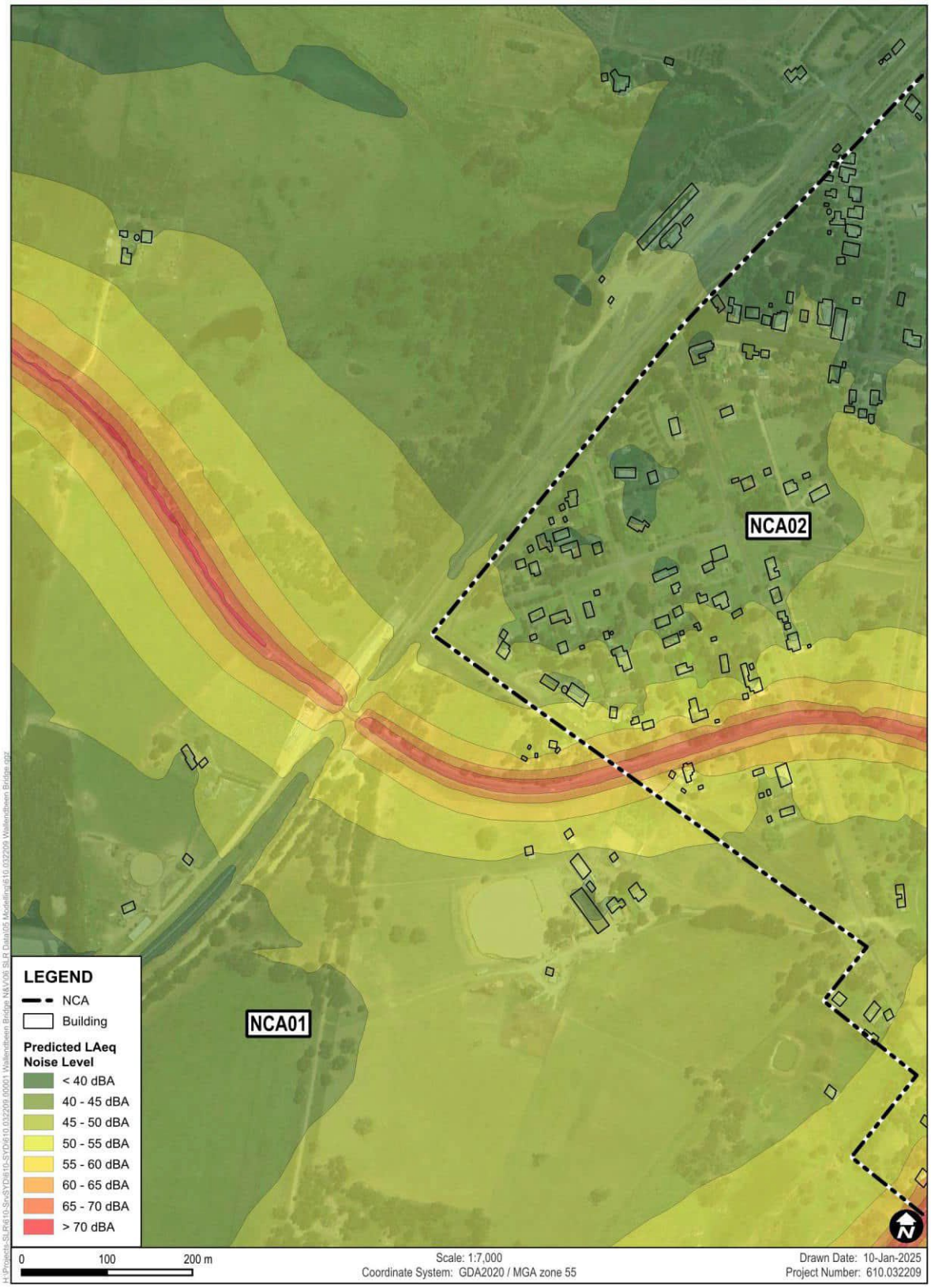
Road	Direction	Validation Traffic Volumes			
		15 Hour Daytime (0700-2200)		9 Hour Night-time (2200-0700)	
		Light Vehicles	Heavy Vehicles	Light Vehicles	Heavy Vehicles
Burley Griffin Way	EB	402	163	24	24
	WB	398	164	22	32
Olympic Highway	NB	986	323	78	39
	SB	980	324	89	50

Table 4 Estimated Traffic Volumes – 2038

Road	Direction	Validation Traffic Volumes			
		15 Hour Daytime (0700-2200)		9 Hour Night-time (2200-0700)	
		Light Vehicles	Heavy Vehicles	Light Vehicles	Heavy Vehicles
Burley Griffin Way	EB	525	212	31	32
	WB	519	214	29	42
Olympic Highway	NB	1,288	421	101	51
	SB	1,280	422	116	65

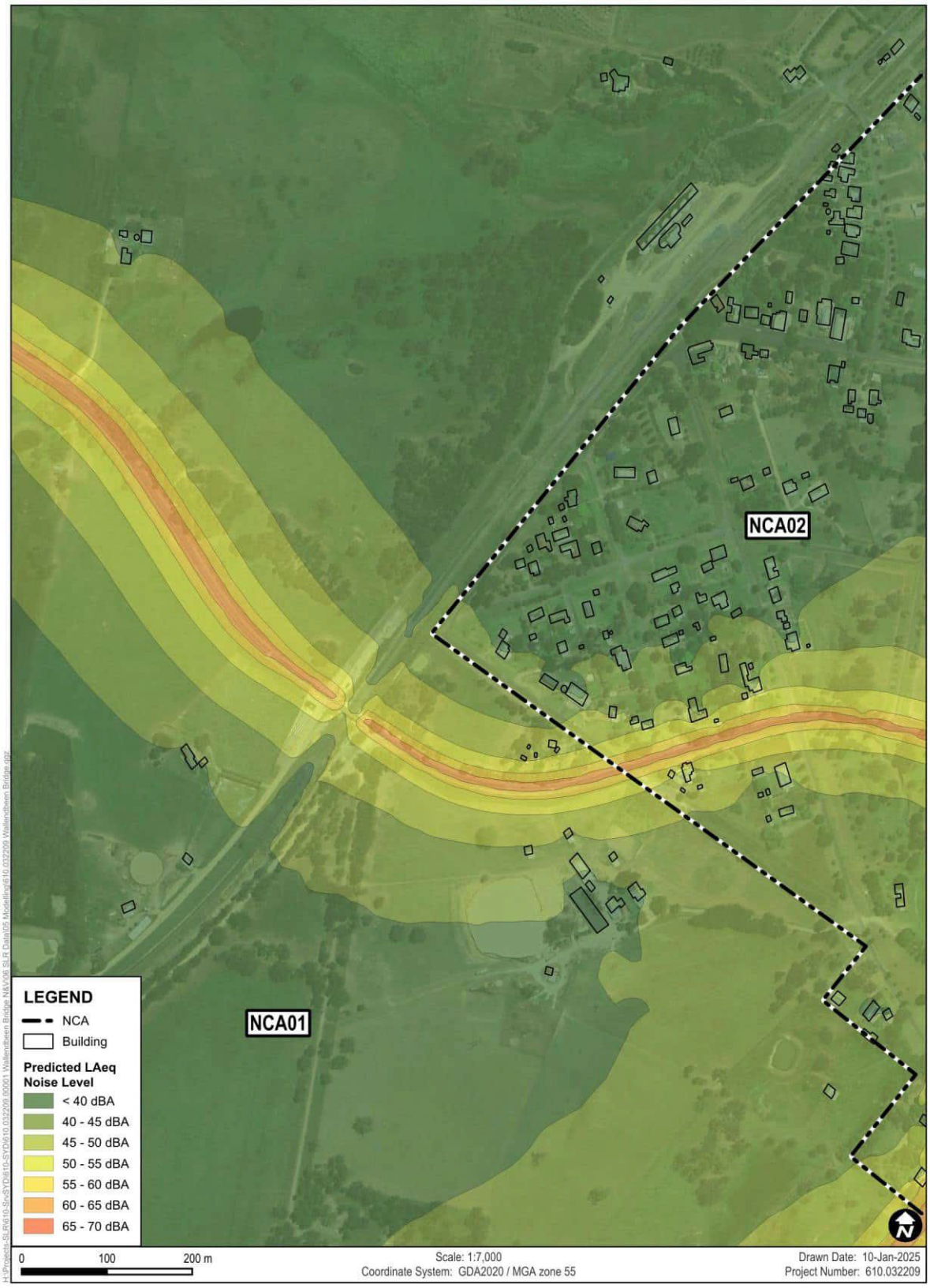
Operational Road Traffic Noise Maps

Figure 1 Predicted Noise Levels No Build 2025 Day



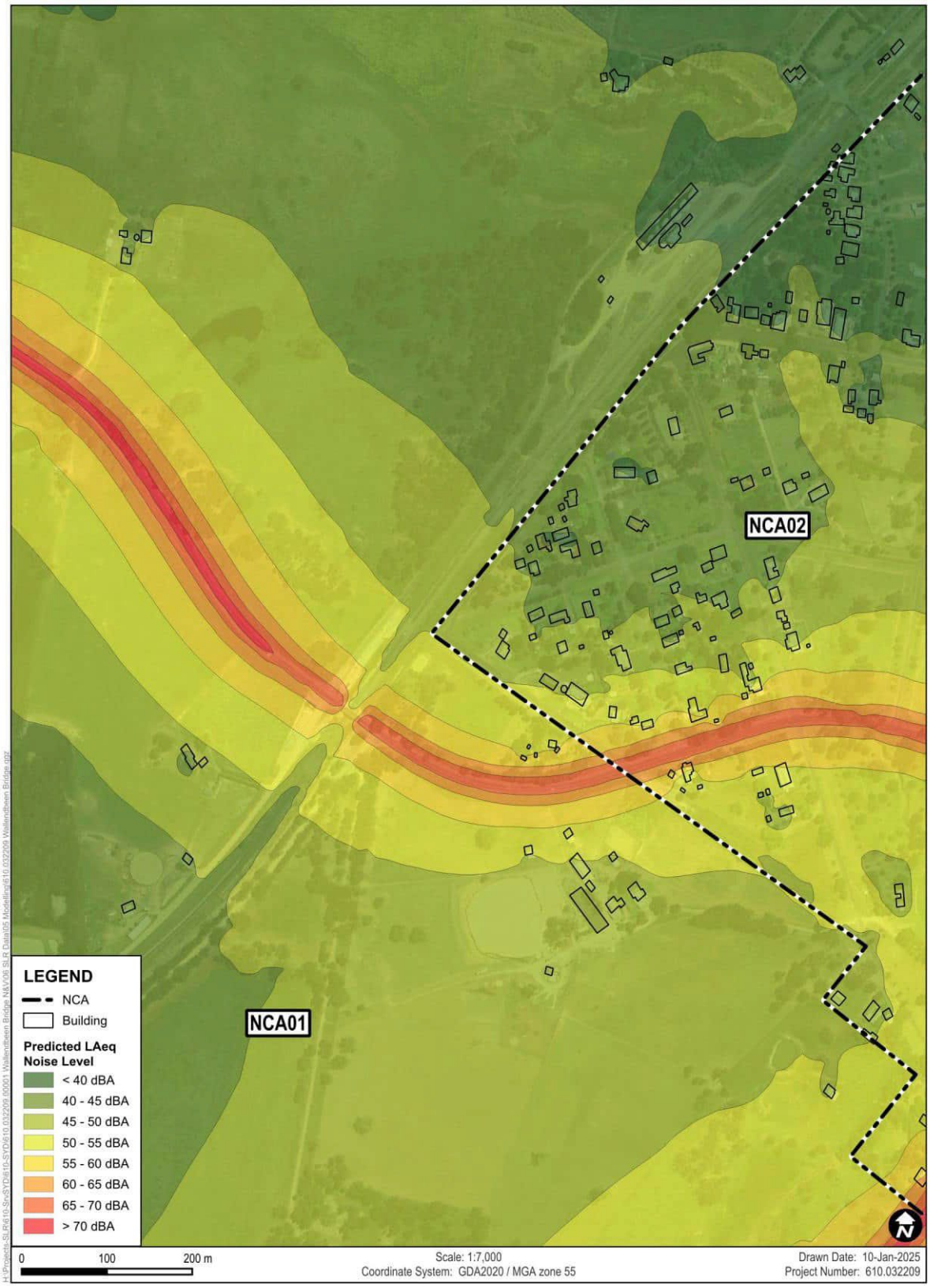
Note 1: The contours are predicted at 1.5 m above ground level and are free-field.

Figure 2 Predicted Noise Levels No Build 2025 Night



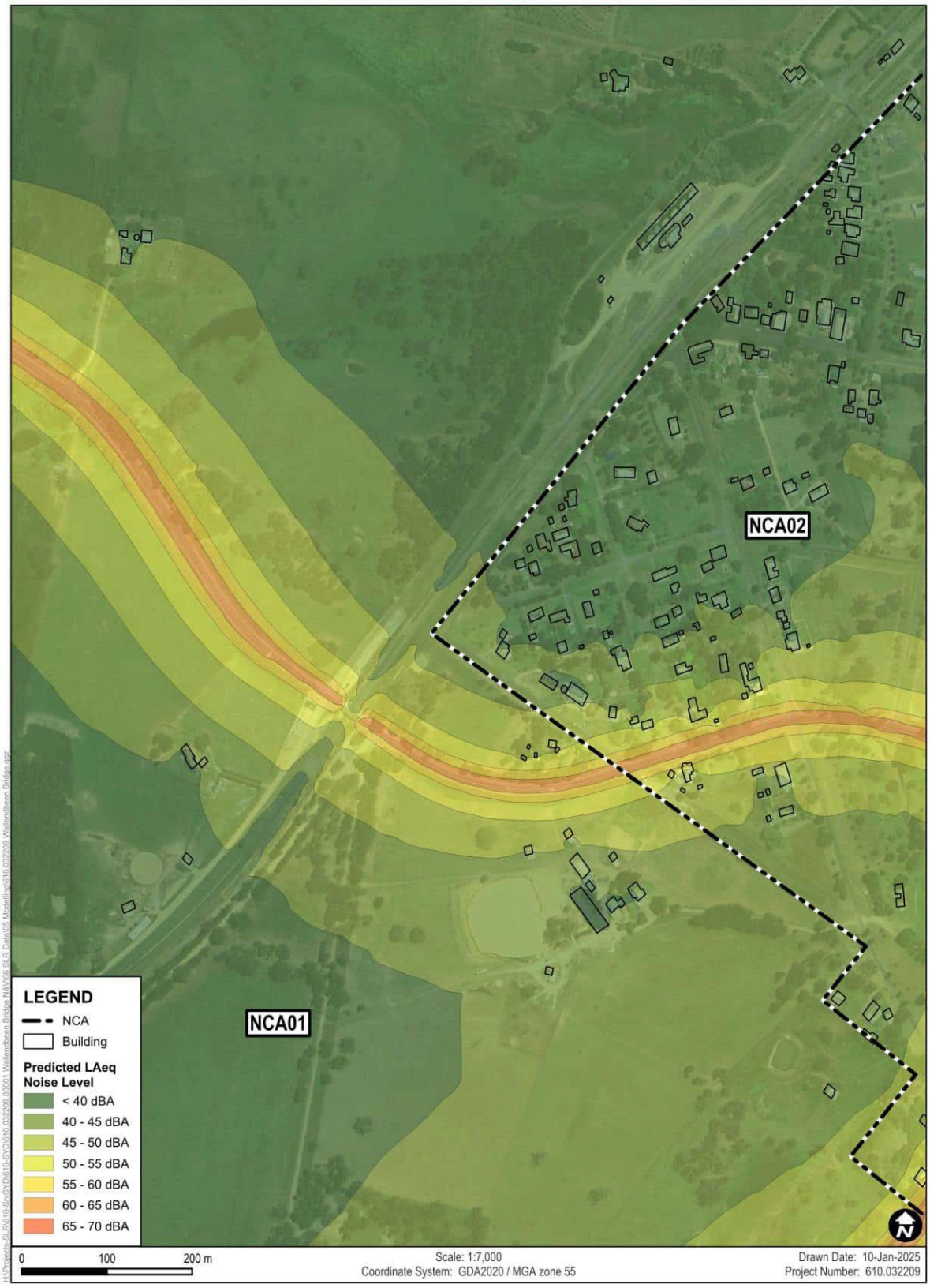
Note 1: The contours are predicted at 1.5 m above ground level and are free-field.

Figure 3 Predicted Noise Levels No Build 2035 Day



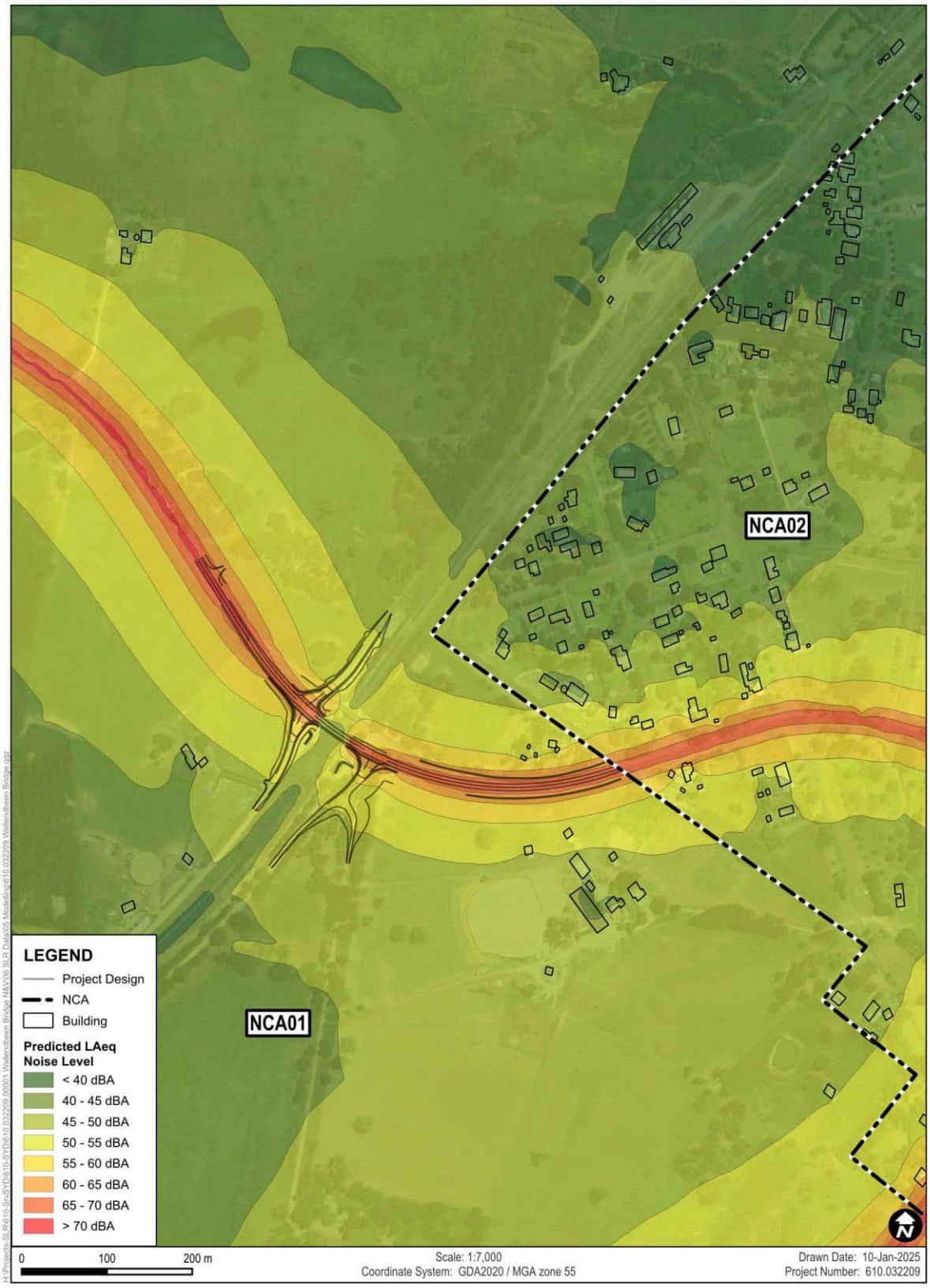
Note 1: The contours are predicted at 1.5 m above ground level and are free-field.

Figure 4 Predicted Noise Levels No Build 2035 Night



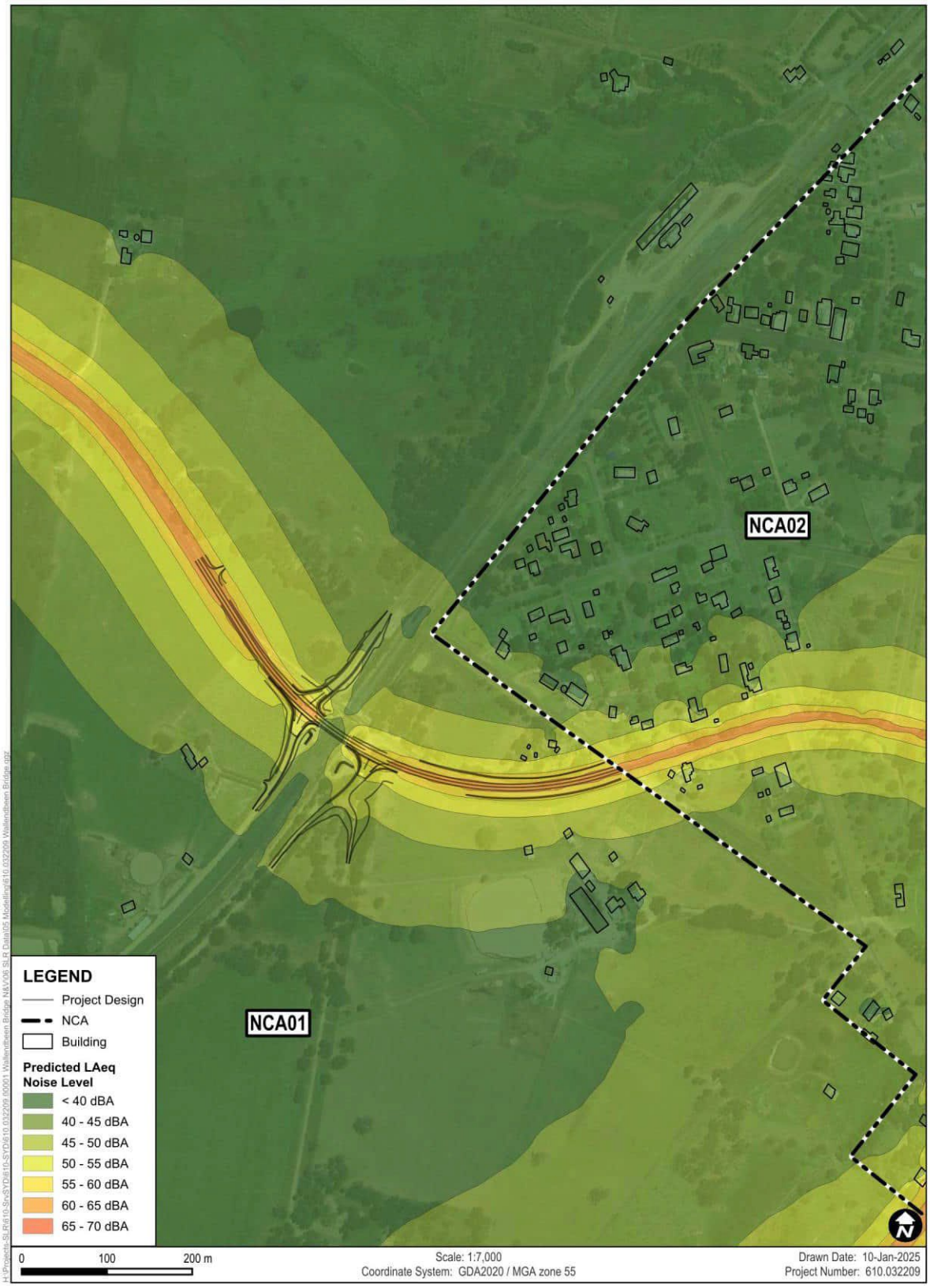
Note 1: The contours are predicted at 1.5 m above ground level and are free-field.

Figure 5 Predicted Noise Levels Build 2025 Day



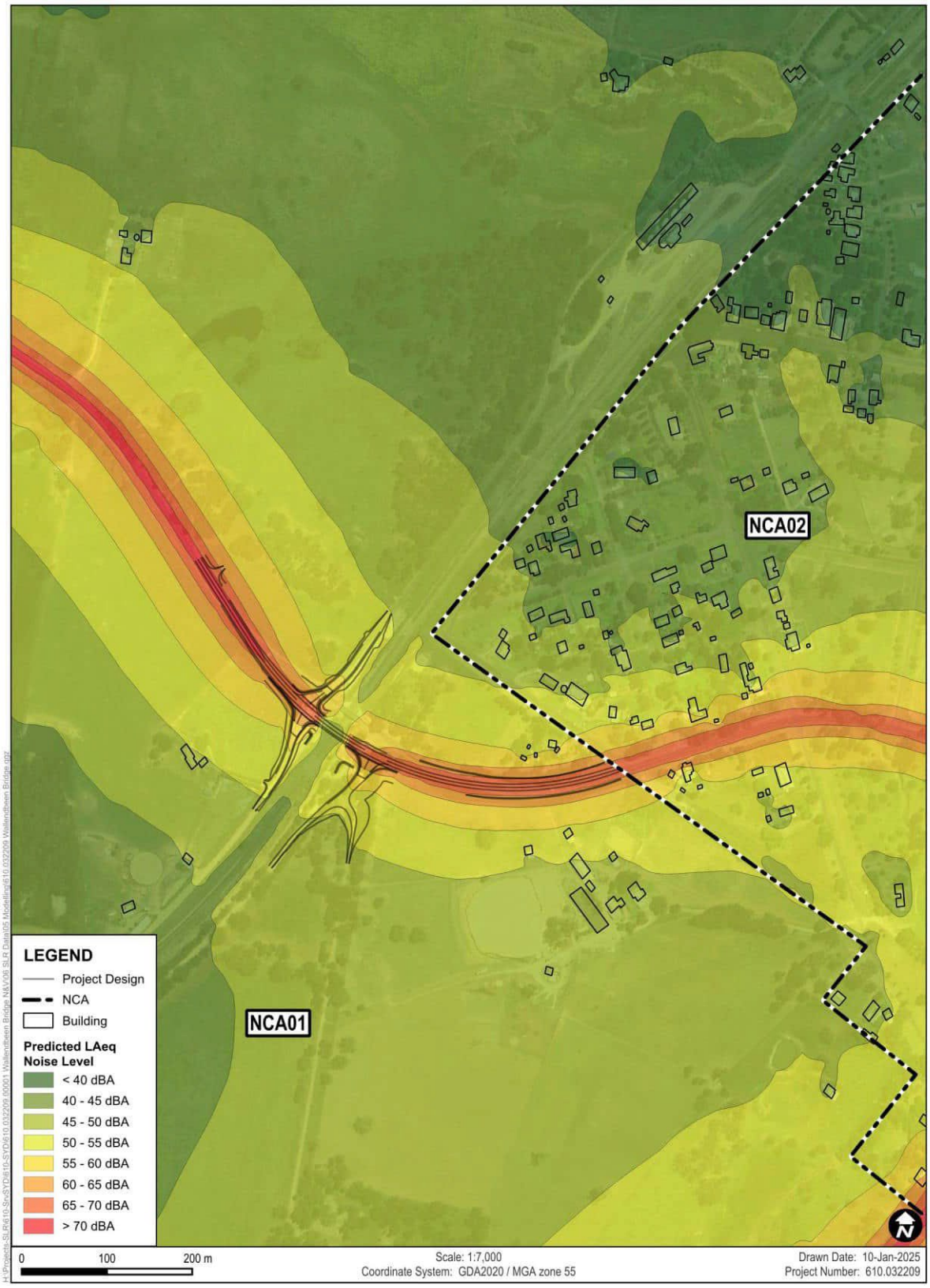
Note 1: The contours are predicted at 1.5 m above ground level and are free-field.

Figure 6 Predicted Noise Levels Build 2025 Night



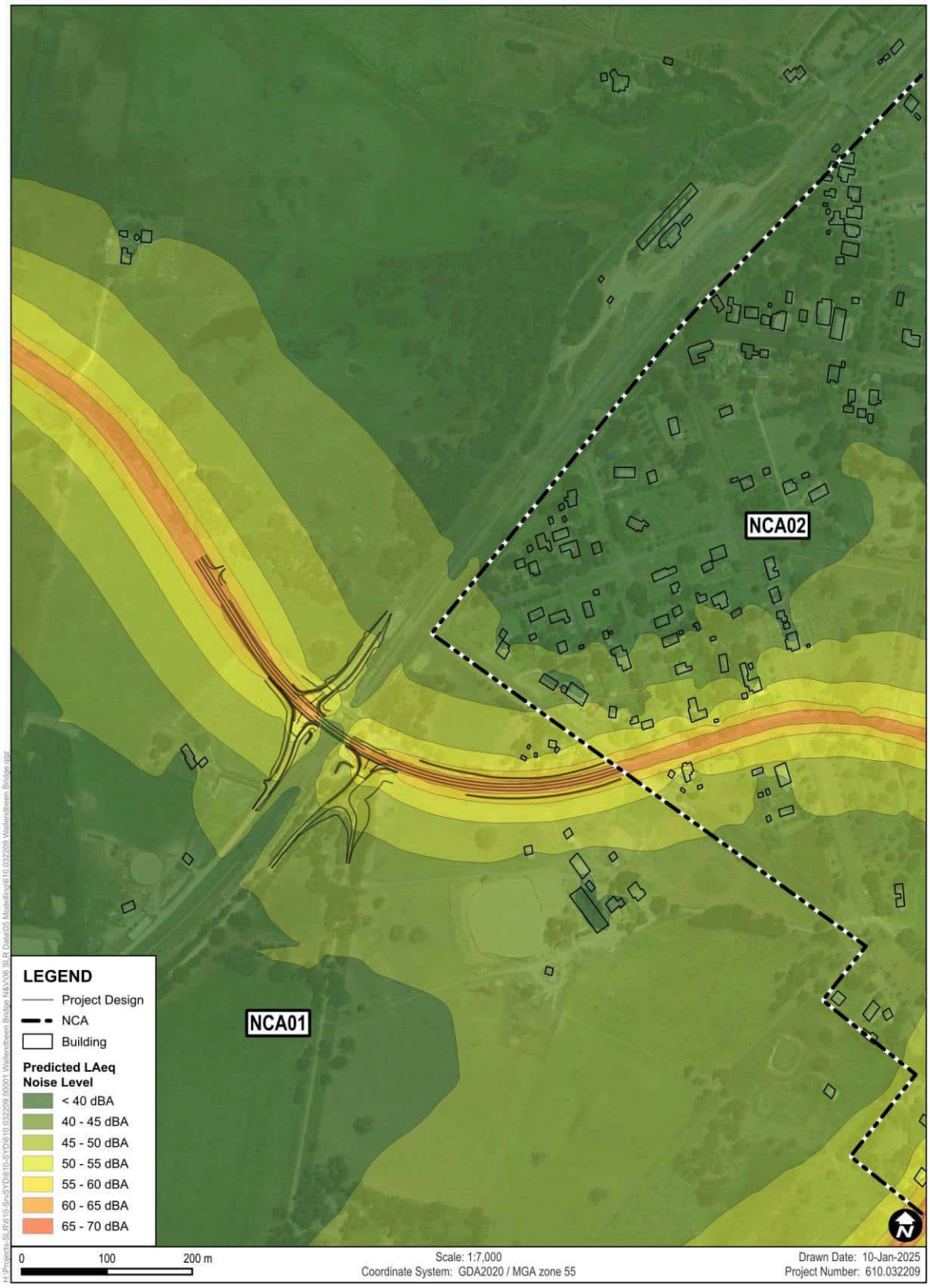
Note 1: The contours are predicted at 1.5 m above ground level and are free-field.

Figure 7 Predicted Noise Levels Build 2035 Day



Note 1: The contours are predicted at 1.5 m above ground level and are free-field.

Figure 8 Predicted Noise Levels Build 2035 Night



Note 1: The contours are predicted at 1.5 m above ground level and are free-field.

Figure 9 Project and Non-Project Roads

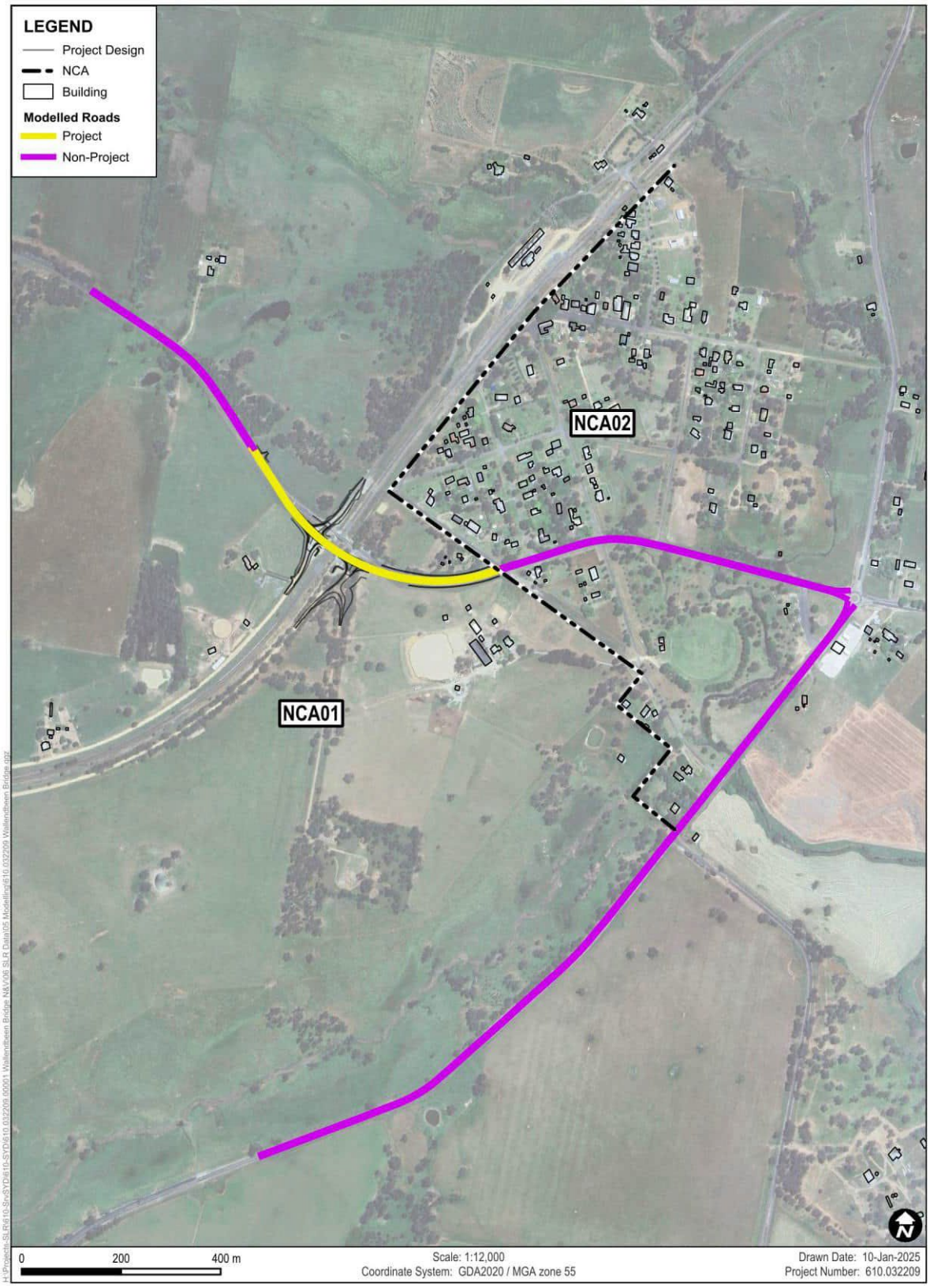


Figure 10 Surface Corrections



Existing Maximum Noise Levels

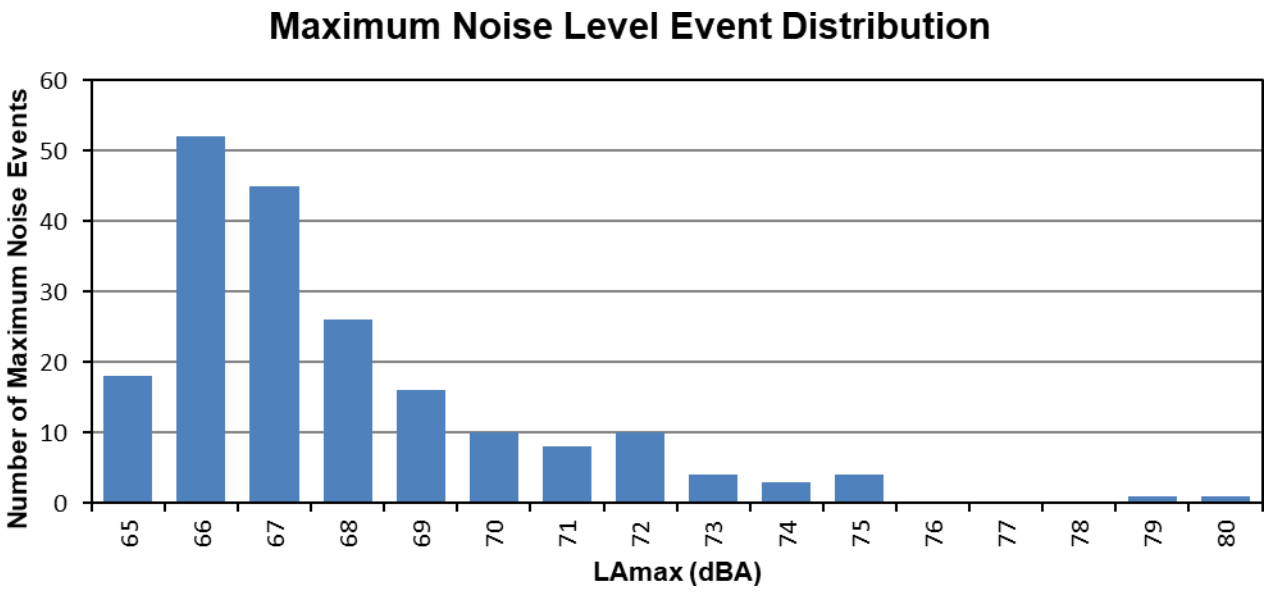
A.1.1 L01– 42 Morrisons Hill Road

Table 5 L01 Maximum Noise Level Events

Monitoring Date	Number of Maximum Noise Events per Hour (LAmax Noise Levels, dBA)									
	00:00-01:00	01:00-02:00	02:00-03:00	03:00-04:00	04:00-05:00	05:00-06:00	06:00-07:00	22:00-23:00	23:00-00:00	Total/ (Range)
8-Nov-24	n/a[1]	n/a[1]	n/a[1]	n/a[1]	n/a[1]	n/a[1]	n/a[1]	3 (66-69)	2 (65-67)	5 (65-66)
9-Nov-24	3 (65-67)	-	-	2 (67-71)	-	2 (65-70)	4 (69-75)	3 (65-67)	-	16 (65-72)
10-Nov-24	-	-	-	2 (66-67)	-	-	1 (67)	-	1 (67)	4 (66-67)
11-Nov-24	6 (66-71)	-	1 (69)	-	-	2 (66)	3 (65-72)	-	-	12 (65-70)
12-Nov-24	4 (73-80)	-	2 (72-74)	-	2 (65-68)	7 (68-75)	1 (66)	4 (65-75)	1 (68)	22 (65-78)
13-Nov-24	4 (67-70)	-	-	5 (66-72)	-	-	-	1 (66)	2 (65-70)	12 (65-69)
14-Nov-24	-	-	-	-	-	-	1 (67)	1 (66)	5 (65-67)	7 (65-66)
15-Nov-24	-	2 (65-68)	-	8 (65-69)	-	2 (65-66)	1 (65)	1 (66)	1 (66)	14 (65-69)
16-Nov-24	-	-	-	-	-	-	-	-	-	-
17-Nov-24	-	-	-	-	-	-	2 (70-72)	-	-	2 (68)
18-Nov-24	2 (65-66)	-	-	-	-	1 (68)	1 (67)	4 (67-71)	4 (68-69)	13 (65-71)
19-Nov-24	5 (66-69)	1 (66)	3 (66-68)	-	1 (66)	-	1 (69)	3 (67-70)	1 (66)	16 (65-70)
20-Nov-24	4 (66-68)	6 (66-75)	-	3 (66-69)	-	3 (69-72)	-	6 (66-72)	3 (66)	27 (65-75)
21-Nov-24	-	-	1 (67)	-	1 (66)	2 (65-67)	2 (66-67)	-	-	6 (65-67)
22-Nov-24	1 (66)	-	-	2 (67-70)	-	1 (66)	-	-	-	4 (65-68)
23-Nov-24	4 (65-73)	1 (67)	4 (69-72)	1 (66)	-	2 (68)	1 (66)	-	-	13 (65-71)
24-Nov-24	1 (67)	-	-	-	-	1 (66)	1 (67)	2 (65)	-	4 (65-67)
25-Nov-24	4 (66-73)	3 (66-68)	1 (67)	-	1 (67)	-	-	2 (68)	7 (65-69)	20 (65-69)
26-Nov-24	-	3 (65-68)	2 (66-67)	-	1 (65)	2 (67)	-	n/a[1]	n/a[1]	8 (65-67)

Note 1: This period was outside of the period of unattended noise monitoring.

Figure 11 L01 Maximum Noise Level Event Distribution of Monitoring Period



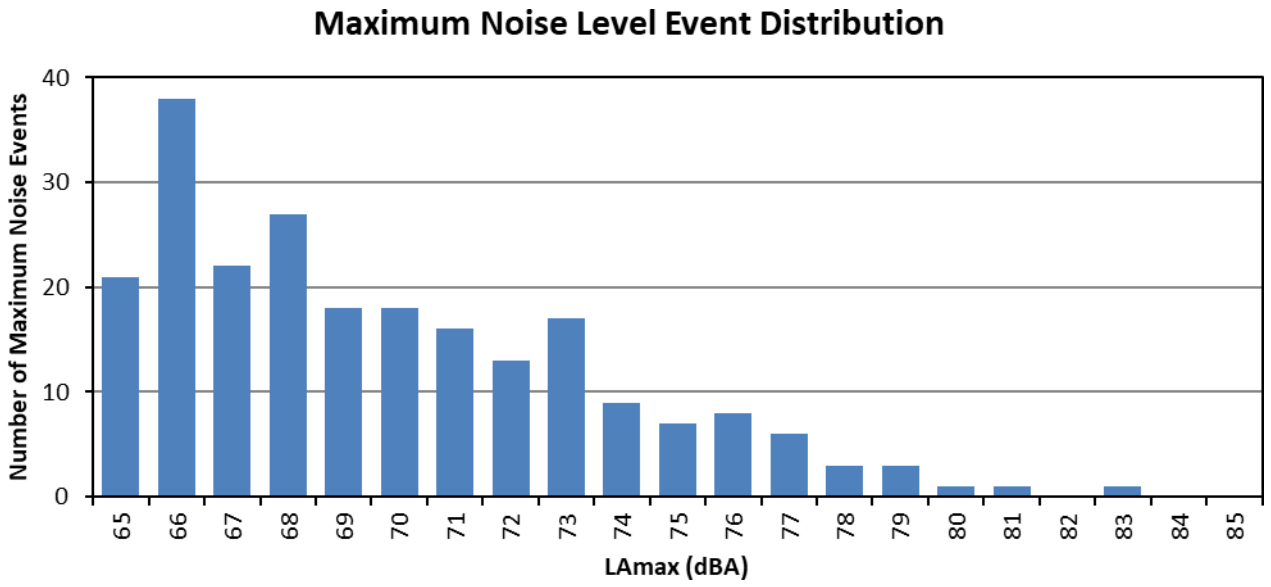
A.1.2 L02 – 1-3 Bland Street

Table 6 L02 Maximum Noise Level Events

Monitoring Date	Number of Maximum Noise Events per Hour (LAmax Noise Levels, dBA)									
	00:00-01:00	01:00-02:00	02:00-03:00	03:00-04:00	04:00-05:00	05:00-06:00	06:00-07:00	22:00-23:00	23:00-00:00	Total/ (Range)
8-Nov-24	n/a[1]	n/a[1]	n/a[1]	n/a[1]	n/a[1]	n/a[1]	n/a[1]	2 (70-71)	1 (66)	3 (66-71)
9-Nov-24	-	-	-	3 (68-77)	-	1 (65)	-	3 (68-74)	-	7 (65-77)
10-Nov-24	1 (68)	4 (65-68)	1 (65)	6 (66-76)	-	-	2 (69-71)	1 (65)	2 (65-70)	17 (65-76)
11-Nov-24	2 (67-75)	-	-	-	-	3 (65-73)	-	-	-	5 (65-75)
12-Nov-24	3 (69-79)	-	2 (66-69)	1 (67)	4 (67-73)	4 (68-73)	-	2 (70-73)	3 (68-73)	19 (66-79)
13-Nov-24	2 (65-68)	1 (65)	-	-	-	2 (67-68)	3 (66-68)	2 (71-75)	3 (68-72)	13 (65-75)
14-Nov-24	1 (66)	-	2 (66-67)	-	1 (68)	-	4 (67-71)	-	1 (66)	9 (66-71)
15-Nov-24	-	-	1 (65)	7 (66-74)	-	-	3 (65-81)	1 (69)	-	12 (65-81)
16-Nov-24	-	-	2 (70-74)	3 (65-70)	-	-	-	4 (66-70)	-	9 (65-74)
17-Nov-24	-	-	-	-	-	-	1 (66)	4 (65-71)	-	5 (65-71)
18-Nov-24	4 (71-76)	3 (66-68)	4 (65-67)	2 (67-70)	1 (70)	6 (65-72)	-	3 (70-77)	6 (70-78)	29 (65-78)
19-Nov-24	-	1 (66)	3 (70-74)	4 (66-72)	3 (67-71)	1 (69)	2 (66-69)	3 (70-73)	1 (65)	18 (65-74)
20-Nov-24	1 (71)	4 (65-75)	-	4 (65-75)	-	-	9 (73-79)	2 (67-77)	2 (69-71)	22 (65-79)
21-Nov-24	1 (66)	-	1 (66)	-	2 (66-73)	-	1 (66)	-	-	5 (66-73)
22-Nov-24	3 (65-68)	4 (65-72)	-	4 (68-75)	-	-	-	-	2 (66)	13 (65-75)
23-Nov-24	2 (75-83)	4 (67-73)	-	-	-	1 (69)	-	-	-	7 (67-83)
24-Nov-24	-	-	-	-	-	-	-	1 (66)	1 (66)	2 (66)
25-Nov-24	3 (71-80)	-	3 (65-73)	1 (71)	-	4 (66-72)	3 (66-70)	-	4 (67-76)	18 (65-80)
26-Nov-24	-	4 (66)	4 (73-76)	-	2 (65-69)	-	6 (65-74)	n/a[1]	n/a[1]	16 (65-76)

Note 1: This period was outside of the period of unattended noise monitoring.

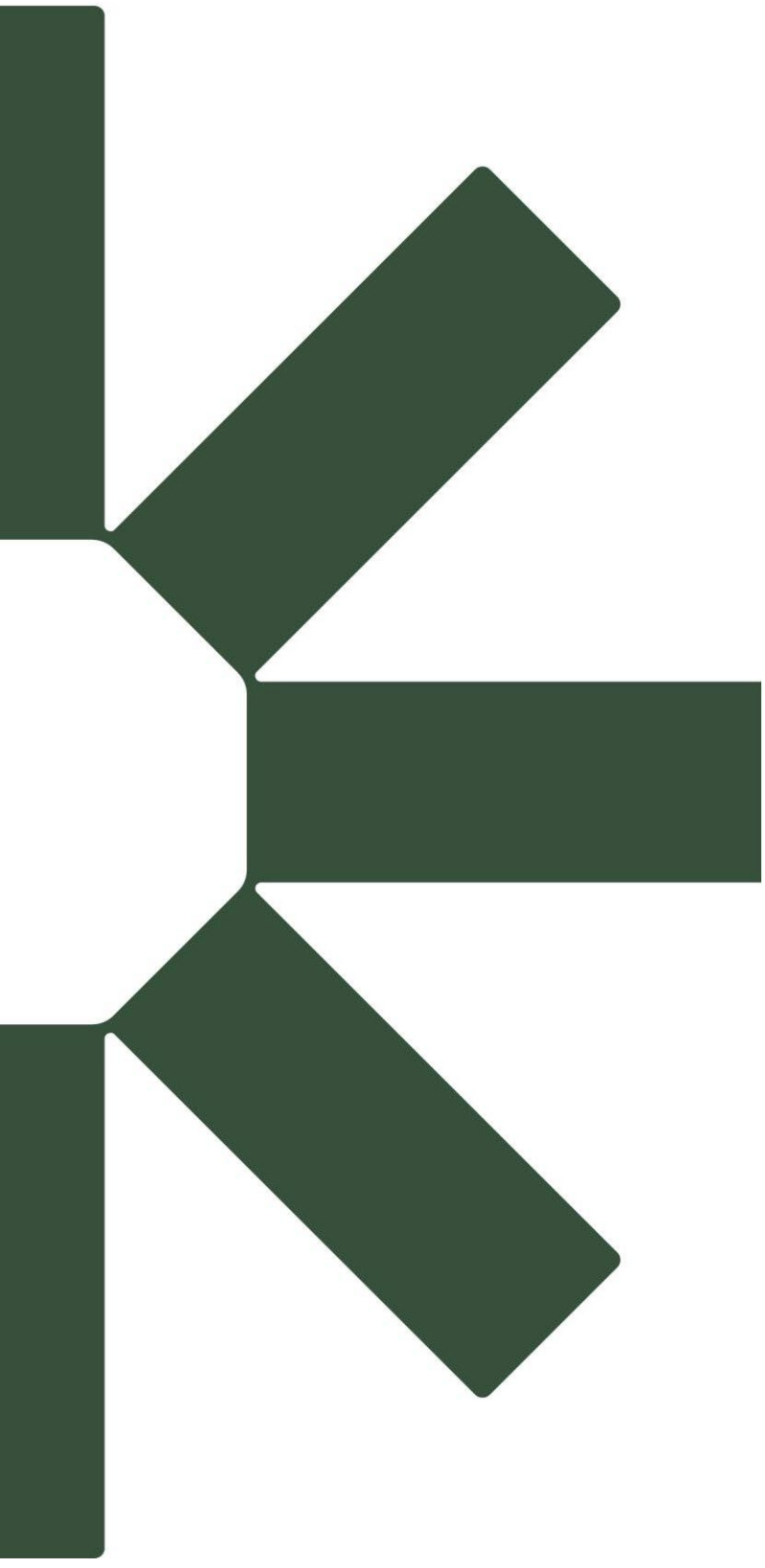
Figure 12 L02 Maximum Noise Level Event Distribution of Monitoring Period



Receiver Assessment Table

Name	NCA	Floor	Easting	Northing	Receiver Type	Address	RNCG Criteria		Predicted Noise Level (dBA)[1]								> 2 dB Increase[2]		Cumulative Limit		Project Acute		Eligible for Consideration of Additional Mitigation
									At Opening (2026)				Future Design (2036)										
									No Build		Build		No Build		Build								
							D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	
NCA01.OOP.0001	NCA01	1	605955	6178451	Other (Outdoor Active)	28 Hoskins St	60	-	48	41	48	41	49	42	49	42	-	-	-	-	-	-	-
NCA01.OOP.0002	NCA01	1	605506	6178502	Other (Outdoor Active)	42 Morrisons Hill Rd	60	-	42	35	43	36	43	37	44	37	-	-	-	-	-	-	-
NCA01.OOP.0003	NCA01	1	605804	6178041	Other (Outdoor Passive)	Wallendbeen Cemetery North Jindalee Road	55	-	47	40	47	40	48	41	48	41	-	-	-	-	-	-	-
NCA01.RES.0005	NCA01	1	605997	6178653	Residential	2 Bland St	60	55	55	49	55	49	56	50	57	50	-	-	-	-	-	-	-
NCA01.RES.0010	NCA01	1	606096	6178480	Residential	28 Hoskins St	60	55	49	43	49	43	50	44	51	44	-	-	-	-	-	-	-
NCA01.RES.0012	NCA01	1	605571	6178639	Residential	42 Morrisons Hill Rd	60	55	51	44	51	45	52	45	52	46	-	-	-	-	-	-	-
NCA01.RES.0013	NCA01	1	605166	6178271	Residential	68 Morrisons Hill Rd	53	47	41	35	42	35	43	36	43	36	-	-	-	-	-	-	-
NCA02.RES.0016	NCA02	1	605939	6178764	Residential	1 Bland St	60	55	50	44	50	43	51	45	51	45	-	-	-	-	-	-	-
NCA02.RES.0017	NCA02	1	605993	6178726	Residential	3 Bland St	60	55	51	45	51	45	52	46	52	46	-	-	-	-	-	-	-
NCA02.RES.0018	NCA02	1	606026	6178712	Residential	5 Bland St	60	55	52	46	52	46	53	47	53	47	-	-	-	-	-	-	-
NCA02.RES.0037	NCA02	1	606192	6178877	Residential	10 Hoskins St	57	50	45	38	45	38	46	39	46	39	-	-	-	-	-	-	-
NCA02.RES.0038	NCA02	1	606194	6178822	Residential	12 Hoskins St	59	52	47	40	47	40	48	42	48	42	-	-	-	-	-	-	-
NCA02.RES.0039	NCA02	1	606229	6178729	Residential	16 Hoskins St	60	55	59	52	59	52	60	54	60	54	-	-	-	-	-	-	-
NCA02.RES.0040	NCA02	1	606267	6178617	Residential	20 Hoskins St	60	55	57	51	57	51	58	52	58	52	-	-	-	-	-	-	-
NCA02.RES.0041	NCA02	1	606271	6178575	Residential	26 Hoskins St	60	55	52	45	52	45	53	47	53	47	-	-	-	-	-	-	-
NCA02.RES.0066	NCA02	1	605976	6178859	Residential	2 Queen St	57	51	45	39	45	39	47	40	46	40	-	-	-	-	-	-	-
NCA02.RES.0069	NCA02	1	605986	6178890	Residential	4 Queen St	57	50	45	38	45	38	46	40	46	40	-	-	-	-	-	-	-
NCA02.RES.0070	NCA02	1	606019	6178883	Residential	6 Queen St	57	50	45	38	45	38	46	40	46	40	-	-	-	-	-	-	-
NCA02.RES.0071	NCA02	1	606049	6178883	Residential	8 Queen St	57	51	45	39	45	39	46	40	46	40	-	-	-	-	-	-	-
NCA02.RES.0072	NCA02	1	606096	6178911	Residential	12 Queen St	56	49	44	37	44	37	45	38	45	38	-	-	-	-	-	-	-
NCA02.RES.0075	NCA02	1	605978	6178805	Residential	3 Queen St	58	51	46	39	46	39	47	41	47	40	-	-	-	-	-	-	-
NCA02.RES.0076	NCA02	1	606005	6178802	Residential	5 Queen St	59	52	47	40	47	40	48	41	48	42	-	-	-	-	-	-	-
NCA02.RES.0077	NCA02	1	606127	6178853	Residential	9 Queen St	56	49	44	37	44	37	45	39	45	39	-	-	-	-	-	-	-
NCA02.RES.0078	NCA02	1	606155	6178622	Residential	1 Victoria St	60	55	64	58	64	58	65	59	65	59	-	-	-	-	-	-	-
NCA02.RES.0080	NCA02	1	606020	6178942	Residential	2 Watson St	55	48	43	36	43	36	44	38	44	38	-	-	-	-	-	-	-
NCA02.RES.0081	NCA02	1	606039	6178811	Residential	8 Watson St	58	52	46	40	46	40	47	41	47	41	-	-	-	-	-	-	-
NCA02.RES.0082	NCA02	1	606078	6178754	Residential	10 Watson St	60	55	51	45	51	45	52	46	52	46	-	-	-	-	-	-	-
NCA02.RES.0083	NCA02	1	606108	6178676	Residential	14 Watson St	60	55	59	53	59	53	60	54	60	54	-	-	-	-	-	-	-
NCA02.RES.0084	NCA02	1	606082	6178972	Residential	5 Watson St	54	48	42	36	42	36	43	37	43	37	-	-	-	-	-	-	-
NCA02.RES.0085	NCA02	1	606125	6178797	Residential	11 Watson St	59	52	47	40	47	40	48	42	48	42	-	-	-	-	-	-	-
NCA02.RES.0086	NCA02	1	606135	6178775	Residential	13 Watson St	60	54	49	42	49	42	50	44	50	44	-	-	-	-	-	-	-
NCA02.RES.0087	NCA02	1	606149	6178742	Residential	13 Watson St	60	55	52	46	52	46	53	47	53	47	-	-	-	-	-	-	-
NCA02.RES.0088	NCA02	1	606198	6178748	Residential	13 Watson St	60	55	52	45	52	46	53	47	53	47	-	-	-	-	-	-	-
NCA02.RES.0089	NCA02	1	606165	6178692	Residential	25 Watson St	60	55	60	54	60	54	61	55	61	55	-	-	-	-	-	-	-

Note 1: The predicted noise level results are based on the triggered facade with the highest noise level per floor. If no facades are triggered, then the highest noise level of all facades is presented for each floor.
Note 2: The >2 dB increase trigger is presented for the facade with the greatest increase per floor and may not be the same as the facade with the highest noise levels shown.



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